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THIS issue of MoToR BoatinG is so brimful of interest that we fail to see how it can but appeal not only to every motor boatman who sees a copy but to everyone interested in boats and the sea or who loves the great outdoors.

THE LEADING ARTICLE in May MoToR BoatinG is by Mr. Loomis, one of our contributing editors, well known to you all, who is about to start on one of the longest and most interesting cruises ever attempted by a motor boat. Mr. Loomis' cruise is being taken solely in the interest of MoToR BoatinG readers. He has recently purchased the 28-foot yawl Hippocampus which will be his home for the next six months during the seven-thousand-odd-mile voyage. Hippocampus is a sturdy little craft powered with a ten h.p. Palmer motor. She was not designed or built particularly for the trip. The boat was selected for this specific reason in order to demonstrate that any properly designed and well-built boat can safely negotiate such a cruise. While her size, 28 feet overall, may appear small, yet, here again we wish to encourage the small boat owner in the love of the sea and to prove that an ocean liner is not necessarily required. Both sail and power will be used en route. With Mr. Loomis' knowledge of marine engines and such a faithful power plant as the one he has chosen, we are sure that we can promise readers that the trip will not work itself into merely a wind-jammer's chowder-party.

WE should particularly like to call your attention to a number of new boats illustrated in May MoToR BoatinG. Boomerang and Fillette are examples of the finest types of motor cruisers being built today. The former is 76 by 18 feet and powered with 144 h.p. Fillette is about the same length but only 13 feet beam and with her two 8-cylinder motors will maintain a speed of 22 miles an hour.

On page 11 is shown a number of striking and characteristic photographs of Gar Wood, the world's greatest race-boat owner and driver. The illustrations show Mr. Wood in many familiar poses and give one an idea how he works as well as plays.

MoTor BoatinG's Correspondence Course is still going over strong. Over one thousand students are now enrolled. The issues which contained the first two lessons are completely exhausted. Many answers to lesson No. 1 have been received and corrected by the fifteen motor boatmen who are acting as the board of examiners. A complete list of the names of those who have passed this lesson is printed in this issue.

The enthusiasm is not confined to the students alone. The examiners themselves just bubbled over with joy when they received the papers. A little story sent to us by Commodore Huckins, of Boston, one of the examiners, is typical. Commodore Huckins' story follows:

"I went to a meeting of the Eastern Yacht Club last night but had in my possession the first batch of papers and was obsessed with the idea that I must correct these and get clear of them promptly. I, therefore, left the Yacht Club meeting early, went home and went to work. At five minutes to one A. M. my sweet wife called up from her mother's, in town (I having supposed that she was upstairs peacefully in bed all this time), and delicately called my attention to the fact that I had agreed to stop for her at her mother's after the meeting!!!"

This month's navigation lesson is on buoys and similar aids to navigation. This is one of the most important subjects, so far, and we know that every reader will find it not only instructive but entertainingly presented.

GOING INTO COMMISSION NUMBER

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MoToR BoatinG, May 1921
VOL. XXVII No. 5

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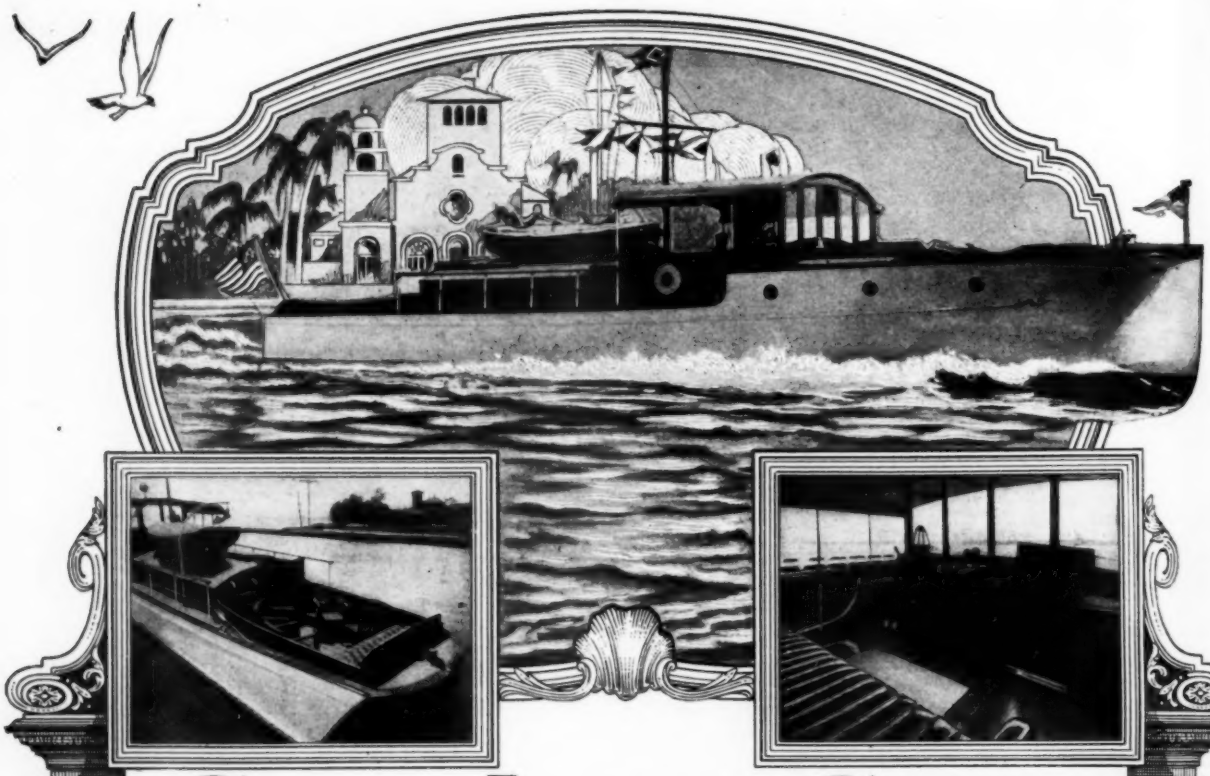
ON pages 27 to 29 will be found a complete design and How to Build article of a tunnel stern 34-foot shallow-draft cruiser which we have named Dolphin. This design is one of the series by Mr. William J. Deed, one complete design of which is appearing in each issue of MoToR BoatinG during 1921.

MoToR BoatinG's cruise story this month takes you through a very interesting part of Canada on that recently opened body of water, Trent Canal. The Canadian Government is spending an immense sum of money on this work, namely, for the motor boatman's pleasure and enjoyment. Navigation on the Trent Canal is free of charge and the rules are so attractive that everyone who can spend his vacation in this beautiful country is advised to do so.

OUR Build a Boat Department this month includes two simple designs of dinghies which can be easily and readily constructed at home. The Way We Would Do It Department, which is that department which answers inquiries from our readers, contains a number of valuable and practical suggestions.

OUR SMALL BOAT Department this month takes up three very important subjects. A number of readers gives their ideas as to why motor boating is the most popular sport. We have never doubted before that it was the king of sports but the arguments we are presenting this month are so conclusive that no one else should doubt it in the future. There is an article on spare parts and tools to be carried on the small boat and several interesting articles discussing ventilation between the frames, solving the problem of preserving the woodwork from dampness which is so detrimental and destructive if it is not properly cared for.



GREAT LAKES CRAFT

With its beauty of line, well-balanced arrangement, and elegance of finish, the trim appearance of the Great Lakes Standardized 54-foot Cruiser commands admiration everywhere.

The large bridge deck and roomy cockpit offer comfortable accommodations for large day parties. Cabin accommodations are all that could be desired in room, comfort and convenience for extended cruising for a party of six or eight and a crew of two.

Twin Screw power plants furnish a speed of over 20 miles per hour, and the draft is moderate for all waters and conditions.

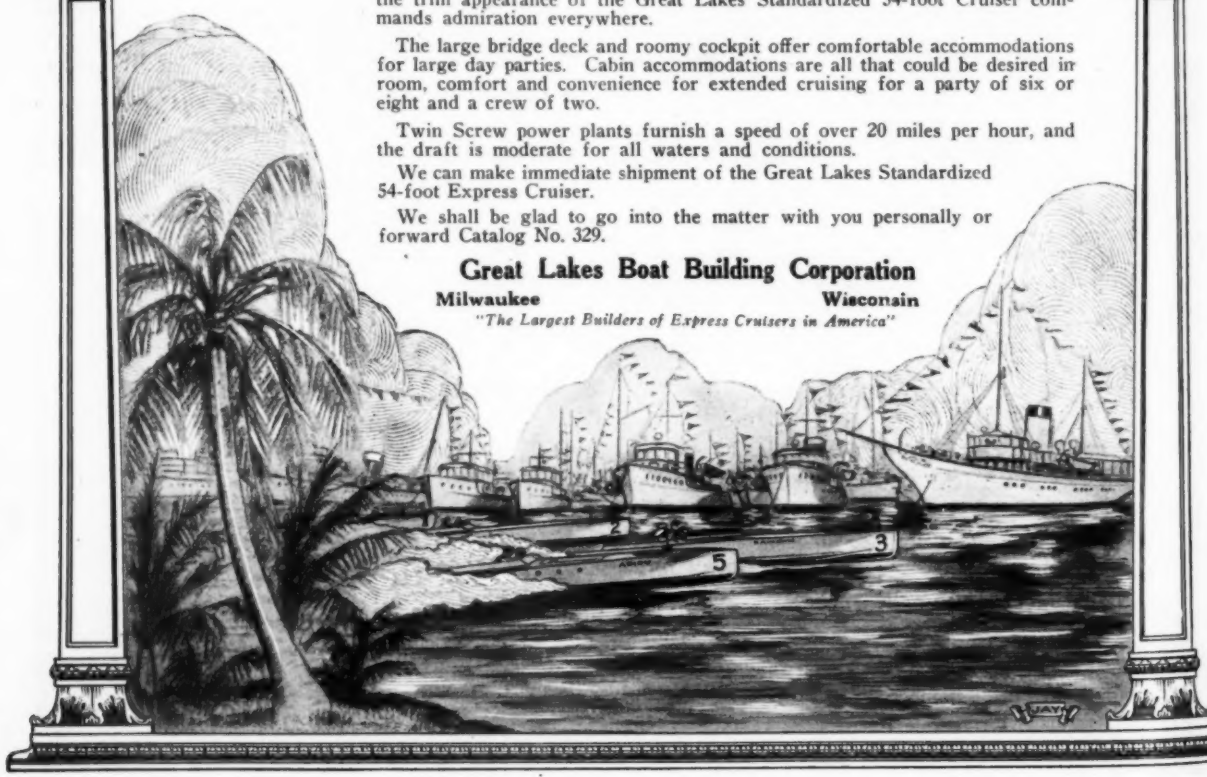
We can make immediate shipment of the Great Lakes Standardized 54-foot Express Cruiser.

We shall be glad to go into the matter with you personally or forward Catalog No. 329.

Great Lakes Boat Building Corporation

Milwaukee **Wisconsin**

"The Largest Builders of Express Cruisers in America"



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MOTOR BOATING

119 West 40th St., New York, N. Y.

The author in the midst of his preparations busily engaged overhauling the propeller and stern bearing.

Photographs by M. Rosenfeld

Hippo' Makes Ready for Her 7,000-Mile Voyage

Cruise from the Atlantic to the Pacific By Motor Boat In the Interest of MoToR BoatinG's Readers Begins To Take Shape

By Alfred F. Loomis

FOR the last few weeks I've had a great deal of sympathy for Noah—not Noah Webster who wrote the English language and made it possible for me to earn a precarious living, but the original Noah, who, as some of my readers are aware, made a historic cruise in a small boat. What his trials and tribulations may have been when he eventually got under way with a crew of griffons, dragons, dodos, and all the other parlor animals of his time do not concern me at the present moment; it fills me with gloom to think of the job he must have had getting them to report to the officer of the deck with their bags and hammocks.

I can imagine a young rhinoceros, who up to the moment of sailing has been keen to make the cruise, pausing

Deck view of the 28-foot yawl Hippocampus in which the author and two shipmates will cruise to San Francisco via the Panama Canal. She was built for deep sea cruising.

Hippo, hauled out in a yard at New Rochelle, reveals her beam, draft, and the depth of her forefoot

ponderously at the foot of the gangplank, giving the architecture of the ark the once-over, and telling old Noah that his father won't let him go. What does Noah do? Look up another hippo when he should be supervising the activities of the chimpanzees in the rigging? Or does he decide to go short-handed? And I can picture a sea-going lion presenting his regrets at the last moment because business at his lair won't permit his absence for even a few months.

Captain Noah must have had his difficulties with every last member of the ship's company, and the fact that he finally got under way with two of each species is greatly to his credit. I dwell on the subject a little more than might be considered necessary because I've had a trial or two and half a dozen tribulations getting together a crew for a cruise to San Francisco. Not that I plan to take a menagerie with me. My search was confined strictly to the human race, but I know, nevertheless, how Noah felt.

Offhand you would say that every American of the masculine persuasion who wasn't tethered to the grave by one leg would jump at the opportunity of sailing a yawl from Hell Gate to the Golden Gate. As a matter of fact, I have proven by advertising and by personal solicitation there are only two along the entire Atlantic seaboard who can cut loose and make the trip. Circumstances permitting, these two will be sailing down the coast with me on the 28-foot auxiliary yawl Hippocampus before this magazine is off the press; and in subsequent issues you will have an opportunity of learning what befalls us en route.

When an ex-Navy friend wrote me in February that he was contemplating a cruise to San Fran and was looking for a fourth man to make up a crew, I wrote twice, telegraphed once, and put in a long distance call to say that he could count me in. And I remember telling him and reiterating in each communication that

Looking aft in the cabin of Hippocampus, showing the installation of the two-cylinder Palmer engine. The galley is on the port side, a chest of drawers and full-length clothes locker to starboard, and with the addition of a pipe berth the sleeping accommodations are for three

I was all the more keen about the cruise because it originated with him and his two friends and so would not be subject to the usual withdrawals of crew members. Those were idle words.

A week later the four of us met in New York and enthusiastically discussed ways and means—ways of finding a suitable boat and means for paying for it when we had located it. That done, I developed a sort of formula which I propounded to each of the three in turn. I said, "I'm glad you took the initiative in suggesting this cruise, because I know you won't back out before it starts. But are you determined to carry it through to the finish of the cruise or of the boat or of us?" Each said he was full of determination and we let the matter rest.

It rested for two weeks while we corresponded about our adventures in boat-hunting, and then one of them wrote as spokesman for the three that they had had to abandon the idea. Money was tight and they were going to cruise overland to the Pacific Coast. They were sorry, but business came before pleasure. I was sorry, too, for by that time I had contracted with MoToR BoatinG to write a story of the cruise, and it didn't look like a single-handed proposition. I might have backed out myself if the March issue of the magazine hadn't appeared with an announcement of the forthcoming cruise which put it distinctly up to me to find not only the boat but an entirely new crew. I called on my three friends in their home town to urge them to reconsider—and found them as much interested in road maps and a pair of patent tweezers which they planned to peddle en route to the Golden Gate as previously they had been excited about charts and navigator's dividers.

From that moment I commenced to sympathize with Noah. Everybody else to whom I broached the subject wanted to go, and nobody could go. Some had family ties, others business obligations, and still others legitimate causes for keeping them at home. Whatever the cause the effect was the same, and I was no nearer to getting my ship's complement. Two or three who really could have gone unfolded the novel idea of writing a story about the cruise, and these I had to reject because of professional jealousy—my own.

My search was complicated by reason of the fact that I am more a motor boatman than a sailor—and this is to be a cruise with sail and power combined. I had to find at least one man of a crew of three who knew sailing from A to X, so that my deficiencies in the gentle art of windjamming might not prove fatal in a crisis. Had I listened to the advice proffered me at this juncture I would have withdrawn myself from the list of possibilities and turned the cruise over to any three professional sailors who cared to take it up. One friend told me all the harrowing details of coming through a West Indian hurricane with nothing but a life preserver to hide his embarrassment, another advised me of the suicidal risk of putting to sea in a sailboat without at least five seasons' experience behind me, and one and all gloomed so effectively that again I was on the point of giving up the cruise.

But I kept in mind the good luck of other amateurs who have sailed the seven seas on faith and intuition, and I persisted to the end that I now have the ideal crew. The first mate is an ex-sub-chaser man with twenty years' experience in sailing large and small craft. He will keep me from jibing when I ought to luff, and in time may hope to teach me the difference between a yawl and a ketch. The second,

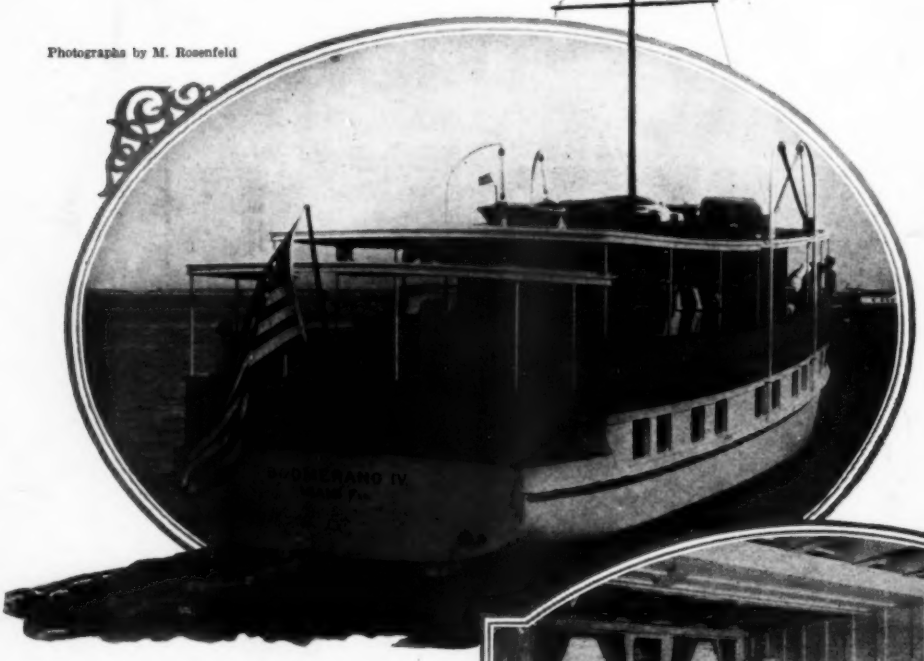
(*Continued on page* 58)

Boomerang IV, A Miami Houseboat

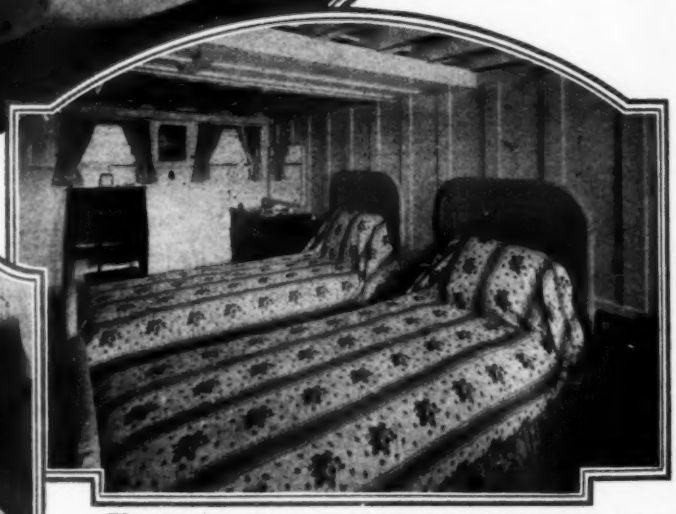
An Innovation in Motor Houseboats Embodying Many Original Features

Recently Launched in Florida for Increased Comfort

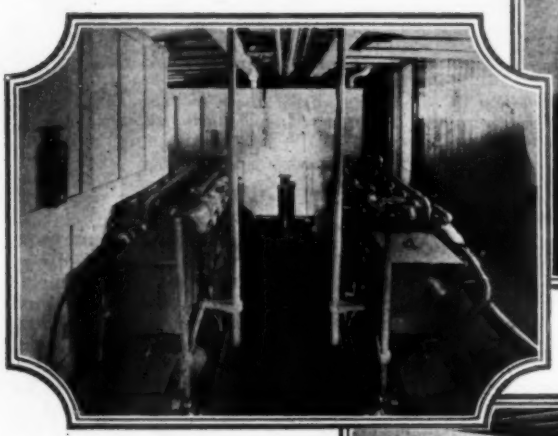
Photographs by M. Rosenfeld



Boomerang IV, recently completed for Huston Wyeth in Florida, is an unusually complete boat. She is 76 feet 10 inches long, with 18 feet 4 inches beam, and the construction was carried out under supervision of her captain. The interior arrangement followed original ideas of her owner



The owner's quarters are elaborately appointed and the decorations follow a uniform color scheme in harmony with the furnishings. Ample space is available on boats of this type



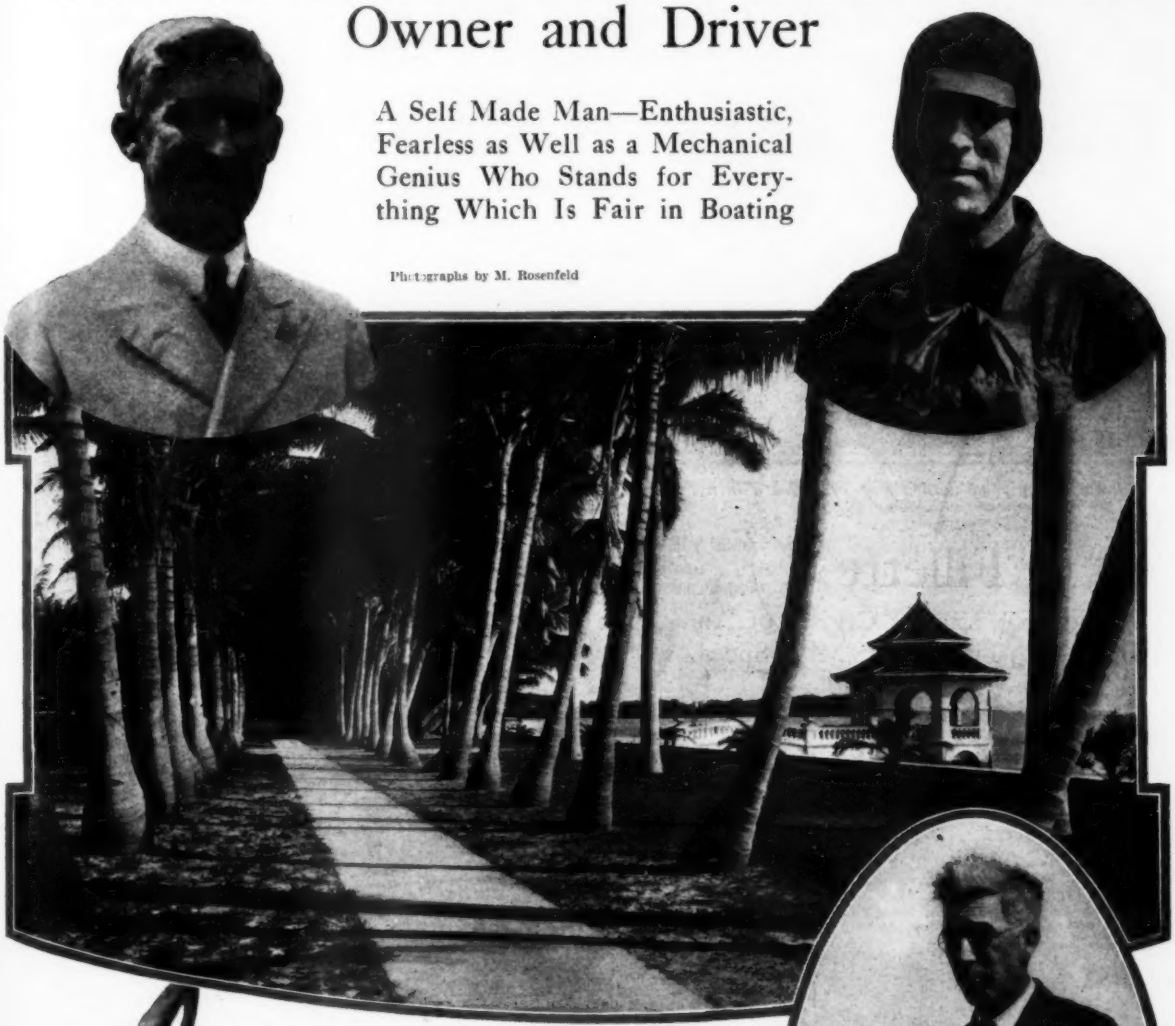
In the engine room is found a pair of Winton 6-cylinder gasoline motors of 140 h.p each. An auxiliary Winton electric generating set is also carried for lighting purposes. The engineer has his quarters in this room and a berth is provided for him

A permanent roof covers the upper deck where spaciousness is a dominant feature. The deckhouse forward is used as a dining saloon, which is open on three sides. The galley adjacent is equipped with all modern appliances

"Gar" Wood, the World's Greatest Race Boat Owner and Driver

A Self Made Man—Enthusiastic, Fearless as Well as a Mechanical Genius Who Stands for Everything Which Is Fair in Boating

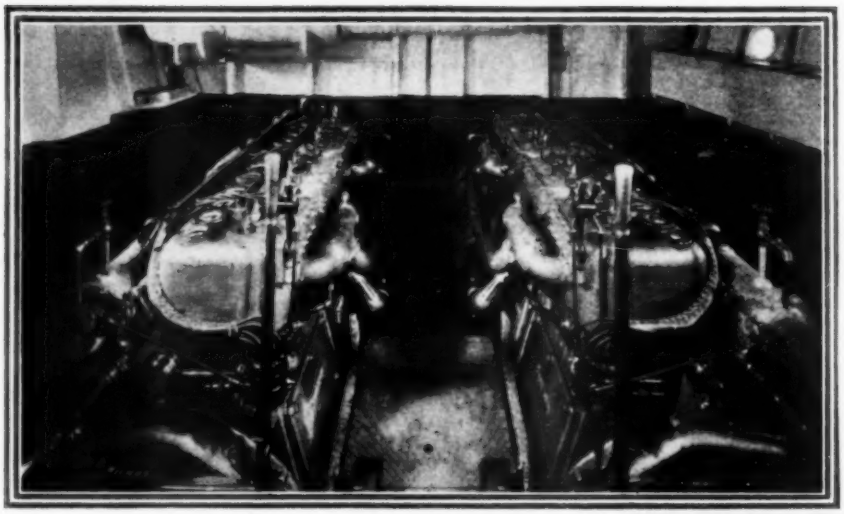
Photographs by M. Rosenfeld



A glimpse of one corner of Mr. Wood's winter home at Miami. As would be expected it is on the waterfront

"Gar" at Bimini aboard Hoosier VI last winter

Mr. Wood takes as much interest in his family as in racing. Above he is shown with "Gar," Jr., and Mrs. Wood

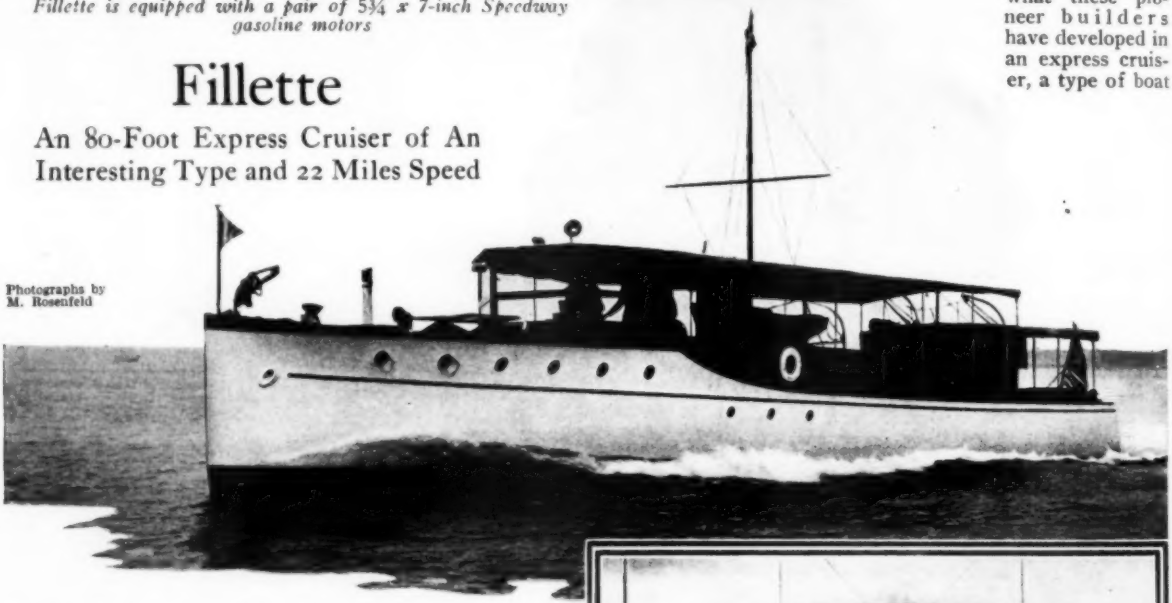


Fillette is equipped with a pair of 5¾ x 7-inch Speedway gasoline motors

Fillette

An 80-Foot Express Cruiser of An Interesting Type and 22 Miles Speed

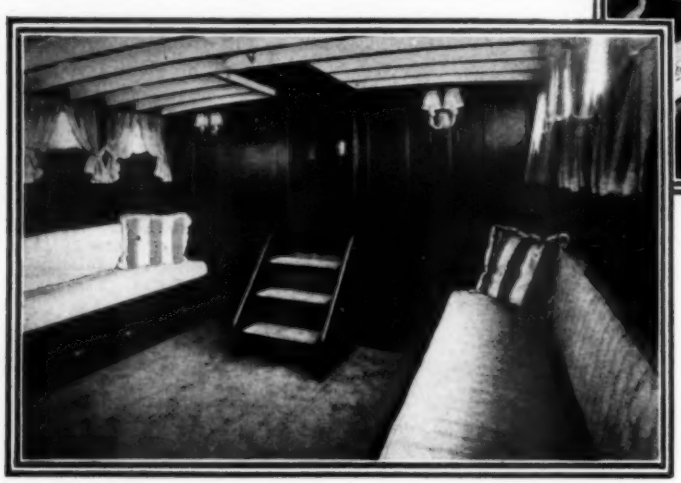
Photographs by M. Rosenfeld



WHEN the United States entered the great World War, the Consolidated Shipbuilding Corporation, Morris Heights, New York City, were constructing a 130-foot steel, motor yacht for J. W. Kiser, New York City. In 1918 the French Naval Commission of the French government purchased this boat for naval use in foreign waters and named it Victoria. This vessel was launched shortly after the armistice was signed and sailed later for France to take an active part in the reconstruction work there. About one year after Mr. Kiser had turned over the steel vessel to the French government he again placed his order with the Consolidated Shipbuilding Corporation for the construction of a handsome motor yacht. This new craft was launched early in 1920 at the yards of the builders on the Harlem River and was christened Fillette, measures 80 feet over all, 13-foot beam with a draft of 3 feet 6 inches.

The design of the Fillette is an expression of what these pioneer builders have developed in an express cruiser, a type of boat in which they have specialized for many years. The layout of the interiors, deck space and after cockpit are characteristics which make the boat an interesting one, and reflects the good tastes of the owner and the artistry of the builders. The motor compartment is a light, airy one with full head room in which two eight-cylinder 5¾ x 7-inch Speedway gasoline engines are installed, together with auxiliary machinery. Officers' quarters are arranged aft of engine room.

The interior and cockpit spaces are roomy and comfortable



Many Motor Boatmen Pass Lesson No. 1

Quality of the Answers Sent In Is of The Best—Quite a Number of Perfect Papers—Questions for Lesson No. 3—Not Too Late to Enroll If You Have Not Already Done So

THE enrollments in MoToR BoatinG's Correspondence Course now number well over one thousand. New enrollments are coming in by every mail. Our issues of February and March, which contained Lessons No. 1 and No. 2, are completely sold out, but we have made arrangements to supply reprints of the articles to those who desire to enroll from now on.

Those answers to Lesson No. 1 which were received previous to April 1 have been passed on by the examiners. The names of those who have successfully passed by at least 80 per cent are published in this issue of MoToR BoatinG. The list contains the names of 267 successful students. On May 1 later answers to Lesson No. 1 as well as all answers received to Lesson No. 2 by that date will be passed on to the examiners.

The names of additional successful students who pass Lesson No. 1 as well as Lesson No. 2 will be published in June MoToR BoatinG. Therefore, if you do not find your name in this issue it may not be because you did not pass, but because your answers were not received in sufficient time to pass them on to the examiners on April 1. Even if you did fail the first time, there is no rule against trying again, or as many times as you desire. Practice makes perfect, you know.

The answers to Lesson No. 1 which were received were both remarkable and marvelous. The examiners were very enthusiastic over the general excellency of the papers. They sent to us the highest words of praise for the students' efforts. The answers show an absolute absence of any copying or word-for-word parrot-style answers. It is very evident that the lesson was carefully studied and the answers written out without referring to the text.

A letter received from Commander H. A. Jackson is typical of the letters which many of the other examiners sent us. Commander Jackson's letter expresses our own thoughts so well that we are reproducing it in full as follows:

"I have corrected the answers to the first set of questions in MoToR BoatinG Correspondence Course, same being the students whose last names begin with the letter 'S'.

"To say that I was gratified with the results does not express my feelings. The result was really wonderful, not alone in the number of the students answering, but in the quality of their answers. Only three out of thirty-nine did not pass, while ten or over twenty-five per cent were so correct that their papers were marked one hundred per cent.

"Another most surprising fact was that the students all seemed to have answered the questions without reference to the text. Of course, this is what they should do for their own good, and I know that the Course is going to be a greater success than anyone ever dreamed of.

"The only thing I noticed with regret was in speaking of the whistle signals, and taking the one whistle signal for example, none of them stated that it meant 'I will pass you on my port side,' while many of them did say it indicated, 'I am directing my course to starboard'—which is not always correct.

"I would suggest that you ask the students to help the examiners a little by observing a few simple rules. If we have one thousand students, and fifty questions a month, and a twelve months' course, it means six hundred thousand answers to correct. This is an enormous amount of work and much time could

(*Continued on page* 84)

Questions for Correspondence Course—Lesson No. 3

(*Published in April* MoToR BoatinG)

Government Navigation Lights, Aids to Navigation, Distress Signals, Fog Signals, Day Marks

Answers should be sent to the Editor of MoToR BoatinG, 119 West 40th St., New York

1. Describe a fixed light.
2. Describe a flashing light.
3. Describe occulting light.
4. Describe fixed and flashing light.
5. Describe group flashing light.
6. Describe group occulting light.
7. What is an alternating light?
8. The Light List describes New London Ledge light as follows:
   Gp. Fl. W. Alt. R.
   Fl. 30 sec.
   3 W., 1 R. flashes.
   Tell briefly in your own language how this light would appear to you.
9. The Light List describes Smyrna light on the Delaware River as follows:

   RANGE { Smyrna Front
   Fl. R., 1 sec. U.
   Smyrna Rear
   Occ. W., 4 sec. U.

   Tell briefly in your own language how these lights would appear to you and how used.
10. What is a red sector and what does it usually indicate?
11. If a fixed white light suddenly became visible ahead of you how would you determine whether it was a vessel's light or a government lighthouse?
12. How far would a lighthouse 100 feet high be visible from a point on deck 9 feet above water?
13. From your Light List name 2 of the lightships, Figures 84—89 April MoToR BoatinG (omit this question if no copy of the Light List is available). Note—Name of lightship has been omitted on side of vessel in sketches.
14. From your Light List describe the appearance of Hedge Fence Light Vessel, the characteristics of its lights, its fog signal, and its international code signal (omit this question if no Light List is available).
15. If you saw 2 weather flags flying consisting of a black pennant over a rectangular blue flag what weather would you expect?
16. If you saw 2 wind or storm flags flying consisting of a red flag with a black center over a red pennant from what direction would you expect winds?
17. If you noticed a vessel flying the code flag "S" with a code pennant over it what would you know this vessel desired?
18. If you were heading into the wind and should hear 2 blasts on the fog horn ahead of you what type of boat would you know was crossing your bow and from what direction?
19. In the fog if you heard the rapid ringing of a bell what would it indicate to you?
20. On the high seas if you heard 2 blasts of a steam whistle in succession at intervals not over 2 minutes what would it indicate to you and what would be your action?
21. On the coastwise waters in the fog if you heard 1 blast of a whistle what would it indicate to you and what would be your action?
22. On the Great Lakes in a fog if you heard a siren what would it indicate to you and what would be your action?
23. In a fog if you heard 1 long blast followed by 2 short blasts on a whistle what would it indicate to you and what would be your action?
24. In a fog if you heard 1 long blast followed by 2 short blasts on a fog horn what would it indicate to you and what would be your action?
25. When does a motor boat use her fog horn?
26. A motor boat or other power vessel aground in a fog gives what fog signal?
27. What caution ought always to be remembered about fog signals in reference to the carrying power and direction of sound in a fog?
28. Should you assume that a fog signal is not being sounded or that you are not near a danger if you do not hear the fog signal?
29. How does a Coast Guard indicate to you that "This is the best place to land?"
30. How does the Coast Guard indicate to you "Do not attempt to land?"
31. What does the American ensign when set Union down indicate?
32. One black ball shown from a steamer indicates what?
33. How does a motor boat indicate that she is in distress at night?
34. If you noticed a lighthouse which was extinguished or not showing the proper light what would you do about notifying the authorities of this fact?
35. In the day time if you saw a lighthouse which has a black and white spirally banded tower with red brick base and granite corner, how would you know what lighthouse this was?

Buoys, What They Mean and How To Use Them

Various Types, Colors and Numbers—The Can, Nun, Spar, Bell, Whistling, Light and Combination Buoys

MOTOR BOATING'S CORRESPONDENCE COURSE IN PILOTING, SEAMANSHIP AND SMALL BOAT HANDLING—LESSON No. 4

By Charles F. Chapman

THIS month's lesson in MoTor BoatinG's Correspondence Course in Piloting, Seamanship and Small Boat Handling takes up the subject of the various types and forms of buoys.

The buoy if properly respected is the motor boatman's greatest friend. However, if the proper caution is not observed in reference to the buoy's points of failing and weaknesses, then the buoy may be the cause of a motor boatman's untimely end.

Buoys alone are not enough. Without the use of other aids buoys very often tell the wrong story. First of all, because of the fact that a buoy must be moored to the bottom, its position is not absolutely permanent, and all moorings will drag under severe conditions if the proper dragging powers are brought into play. Therefore, the motor boatman should never assume that a buoy is in its proper location unless he has absolute reason to believe and to know that it is. To be sure, the department of our government charged with the responsibility of placing and maintaining the buoyage system of the country does everything within its power to keep buoys properly located; no expense is spared in this work. However, errors in position are likely to occur. Therefore, the motor boatman is urged to show the greatest respect for buoys at all times.

The system of marking buoys adopted by our government is well known to every follower of the sea. It is hard to imagine a better system than the one adopted. Yet, again, if the mari-

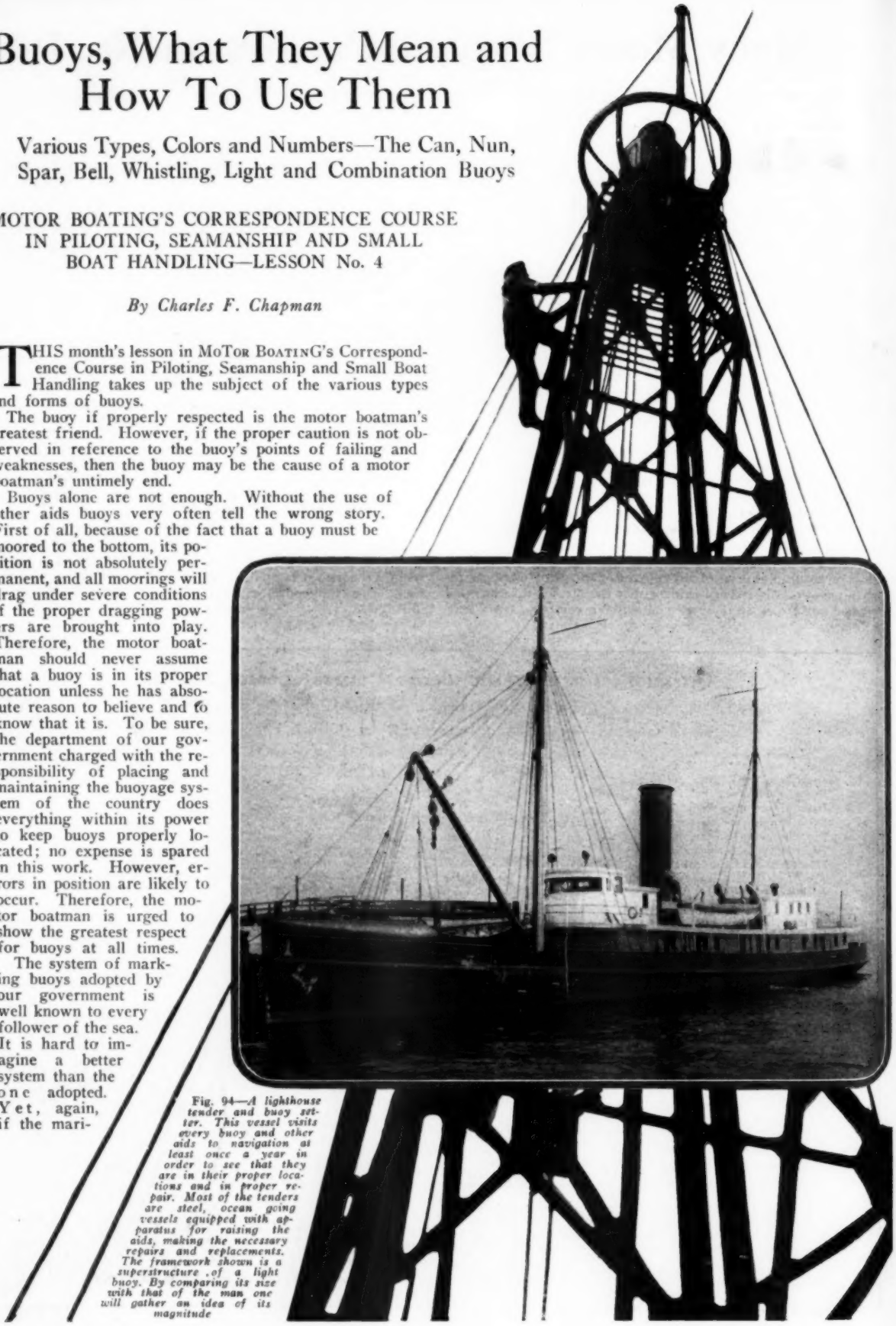


Fig. 94—A lighthouse tender and buoy setter. This vessel visits every buoy and other aids to navigation at least once a year in order to see that they are in their proper locations and in proper repair. Most of the tenders are steel, ocean going vessels equipped with apparatus for raising the aids, making the necessary repairs and replacements. The framework shown is a superstructure of a light buoy. By comparing its size with that of the man one will gather an idea of its magnitude

Fig. 95—*A bell buoy undergoing its spring overhauling. Most of these buoys are made of iron or steel with a number of water tight compartments to prevent sinking should they be damaged by collision or ice*

ner does not apply a certain amount of common sense in his application of this system of markings he is likely to go wrong.

The chart is the greatest aid to navigation and should be referred to in every instance where doubt exists both in reference to the proper position of a buoy and the correct side on which the buoy should be passed.

While this Correspondence Course has not, as yet, reached the subject of government charts, yet it is not improper to, at least, refer to them briefly at this time. The charts published by our government of the coastal and inshore waters show the location of every buoy as well as all other aids to navigation. The offshore charts and those of large scale show only the important buoys and aids, while the harbor charts show all buoys. Therefore, in making use of buoys in piloting, particularly in strange

Fig. 96—*Some of the ballast balls which are attached directly to the buoy to keep it in an upright position. The mooring chain is attached to the lower portion of the ballast ball*

waters and when navigating in a body of water for the first time, it is always well to refer to your chart of the particular locality.

It is an easy matter to get a check from the chart to determine whether the buoy is in its proper location or whether it has dragged from it. The chart gives data enough to readily determine this. Various symbols have been adopted for showing the different types of buoys on the chart. A reference to Figs. 106 to 109 will make this point clear. Actual colors are used on the charts; e. g.: red buoys are shown in color as are the black buoys. Of course, the buoy as shown on the chart is not drawn to the proper scale in comparison with the other data shown on charts. The actual location of the buoy is at the point on the chart indicated by the small dot just under the buoy.

The type of buoy is also indicated on the chart. S indicates a spar buoy, C a can buoy, and N a nun buoy. The various types of bell, light and whistling buoys generally have this data spelled out in full. Light buoys are marked by a star located just beneath the buoy marking.

Buoys are, as a rule, employed to mark shoals or other obstructions, to indicate the approaches to and limits of channels or the fairway passage through a channel, and in some cases to define anchorage grounds.

(*Continued on page 92*)

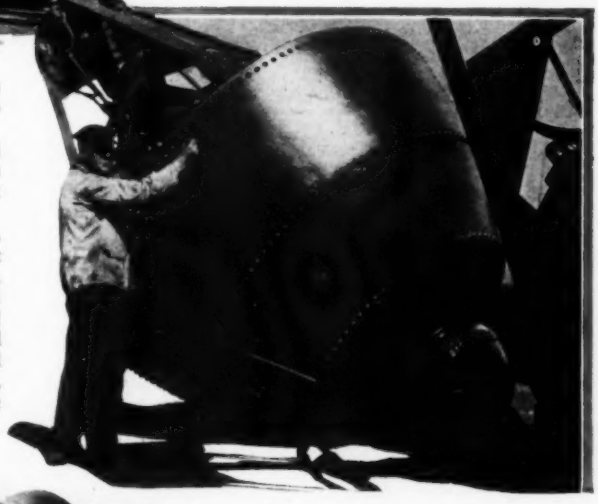


Fig. 97—*The underbody of a bell buoy. As will be seen the major portion of these buoys is below the surface of the water*

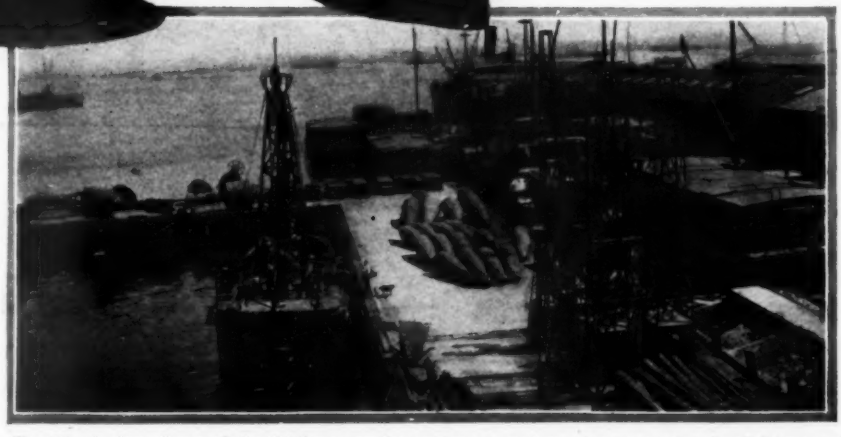


Fig. 98—*A view of one of the lighthouse service and repair stations where a supply of relief buoys of all types is always kept on hand. In the foreground will be seen a light vessel undergoing its annual overhauling*

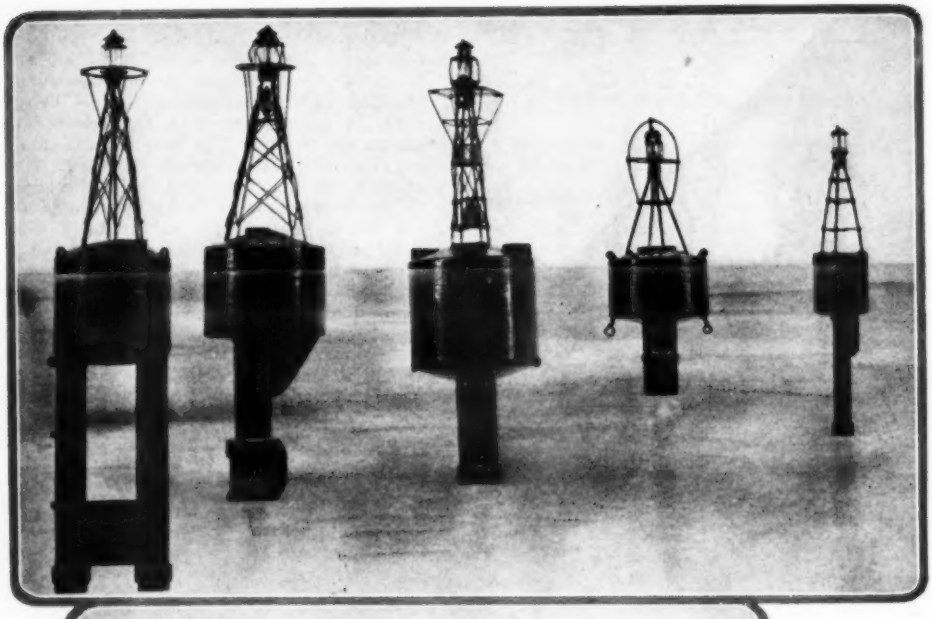


Fig. 99—*Types of gas buoys operated by compressed acetylene. These buoys are painted either black or red in color according to their location and the side on which it is proper to pass them. The gas is contained either directly in the body of the buoy or in tanks fitted into compartments of the body and is piped to the lantern at the top of the superstructure*

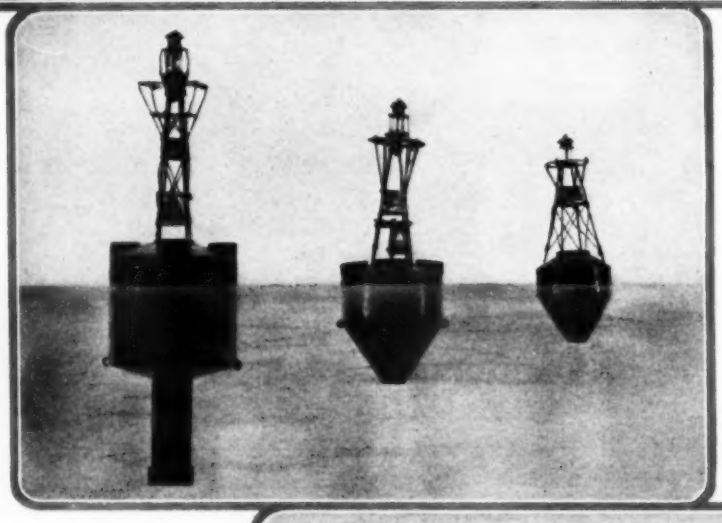


Fig. 100—*Three compressed acetylene buoys of the lighthouse service type. If the light is flashing, as is commonly the case, a small pilot light burns continuously and ignites the main burner as gas is admitted from the flashing chamber, which is a regulating compartment in the base of the lantern provided with a flexible diaphragm and valves for cutting off and opening the flow of gas at intervals, the operation being due to the pressure of the gas in the reservoirs*

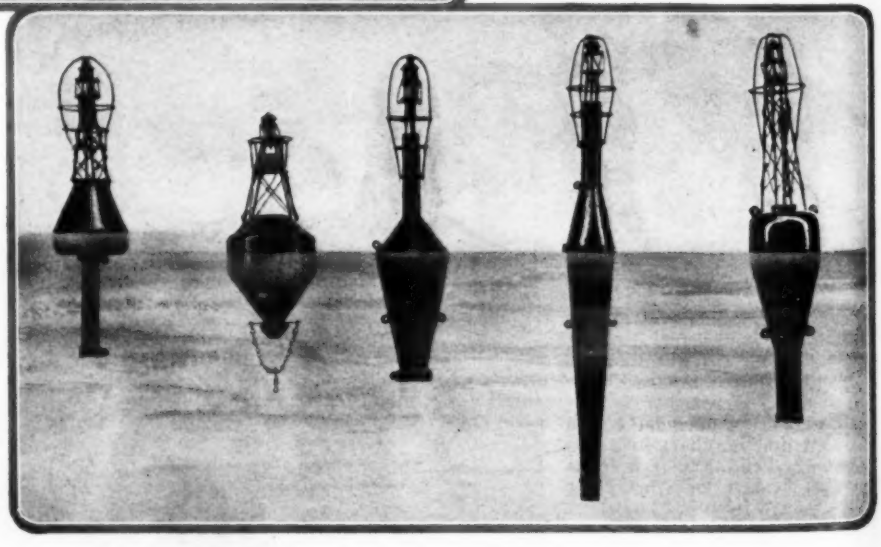


Fig. 101—*Types of compressed oil gas buoys. The length of the light and dark periods may be adjusted to produce the desired characteristic, such as five seconds light, five seconds darkness, etc. Some types burn the gas as an ordinary flat flame, while others make use of an incandescent mantle*

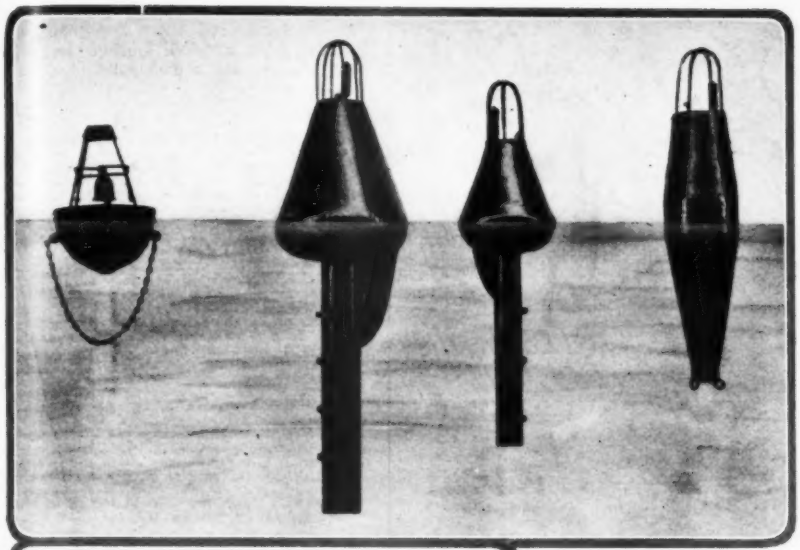


Fig. 102—*The ordinary type of bell buoy and 3 types of whistling buoys. All of these buoys depend upon the action of the sea for much of their value and are, therefore, not to be relied upon in calm weather. The whistling buoy is most efficient in rough outside waters where a ground swell exists and is employed for important points where a sound signal is considered desirable*

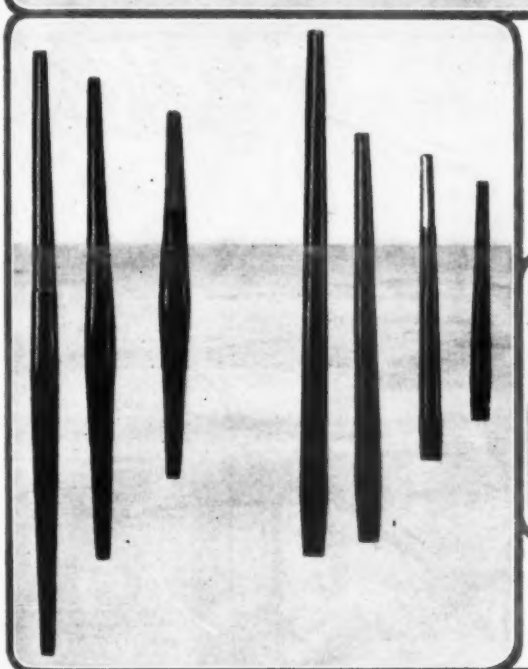


Fig. 103—*The 3 classes of iron spar buoys and the 4 classes of wooden spars. Iron spars range in diameter from 2 to 3 feet, in height above the waterline from 8 to 15 feet, and in draft from 23 to 37 feet. The wooden spars range from ¾ foot to 1¾ feet in diameter at the waterline, from 7 to 20 feet in height above the waterline, and from 14 to 30 feet draft*

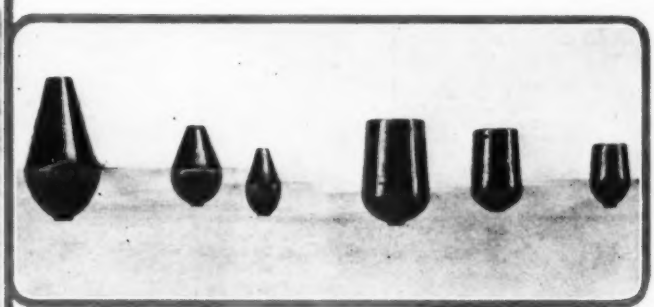


Fig. 104 (above)—*Three classes of nuns and 3 classes of cans. These buoys are used at important channels and turning marks. The nuns are generally painted red with even numbers and the can buoys are painted black with odd numbers. They may also be used as a channel buoy and painted with black and white vertical stripes, or used as an obstruction buoy and painted with black and red horizontal stripes. Neither channel nor obstruction buoys are numbered*

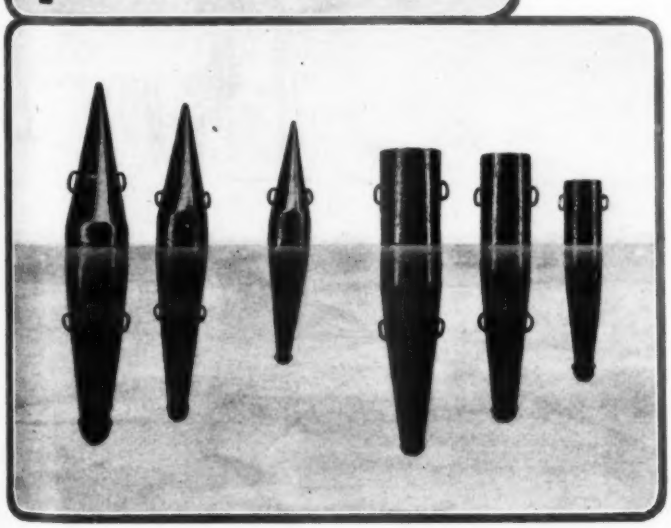


Fig. 105—*The 3 classes of tall cans and the 3 classes of tall nun buoys. The use and meaning of these buoys is identical with those shown in Fig. 104 except that they are used in more important places and at locations where the ordinary type of nun or can buoy cannot be used on account of sea or weather conditions*

Note: In figures 106-109 red buoys are shown with a black outline and black buoys are shown solid black.

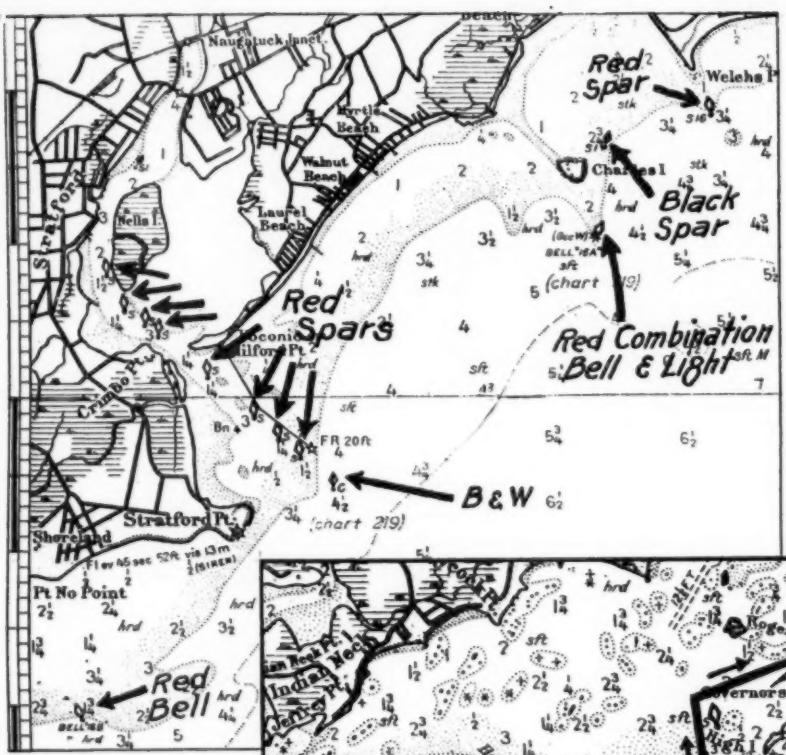


Fig. 106—*Without the use of a chart in navigating one is apt to go wrong if he depends upon buoys alone. Although, theoretically, the system of colors used on buoys is such to enable the mariner to know on which side the buoys should be left, yet, in practice this scheme does not always work out. A red buoy should be left on your starboard side, and a black buoy on your port side when entering a harbor. However, many situations develop in actual practice of such a nature that one may be both entering one harbor and leaving another at the same time. Such a situation requires the greatest caution. The chart must be used in every instance to determine on which side it is proper to pass a particular buoy; e. g.: in Fig. 106 (at the left) when entering the harbor at the top of the page from the south the red combination bell and light buoy, No. 16A will be left on the port hand, black spar buoy, No. 1, will also be left on the port hand, while red spar, No. 16, will be left on the starboard hand when entering this harbor. In approaching the Housatonic River from the south red bell buoy, No. 16B, should be left on the port hand, the black and white channel buoy may be left on either hand, and the red spars up the river must be all left on the starboard side*

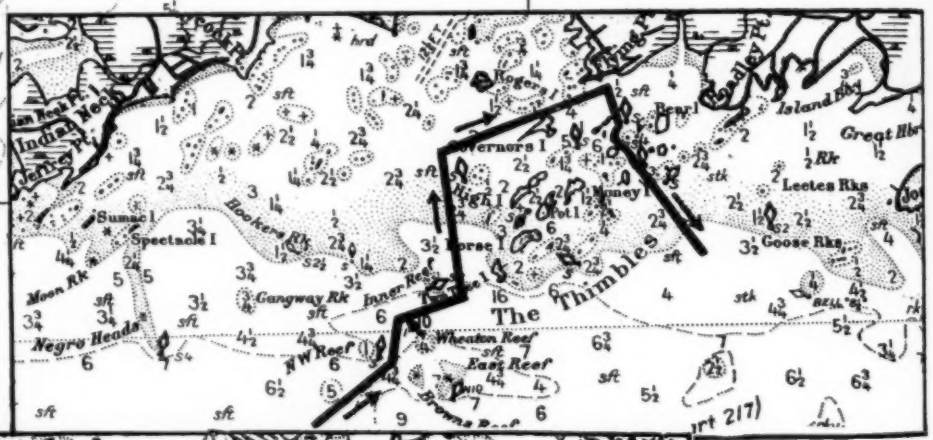


Fig. 107 (at the right)—*Navigating waters of this kind requires the greatest care. It is not sufficient to rely upon the coloring of buoys alone to know upon which side they should be passed. A chart must always be consulted also. Examination of the course shown by the black line in Fig. 107 should convince one how essential the use of a chart is in connection with buoy sailing.*

Fig. 108 (at the left)—*In entering this harbor a careful survey of the chart is necessary to determine the best course; e. g.: the red spar at the extreme left should be left on the port hand. If red spar 20-¼ is left on the port hand it would take one over the very shallow water indicated by the shaded line. The best water is to be had by passing red spar 20-¼ on the starboard hand, black spar No. 1 on the port hand*

Note that some red buoys are left on the port hand and others on the starboard hand and vice versa

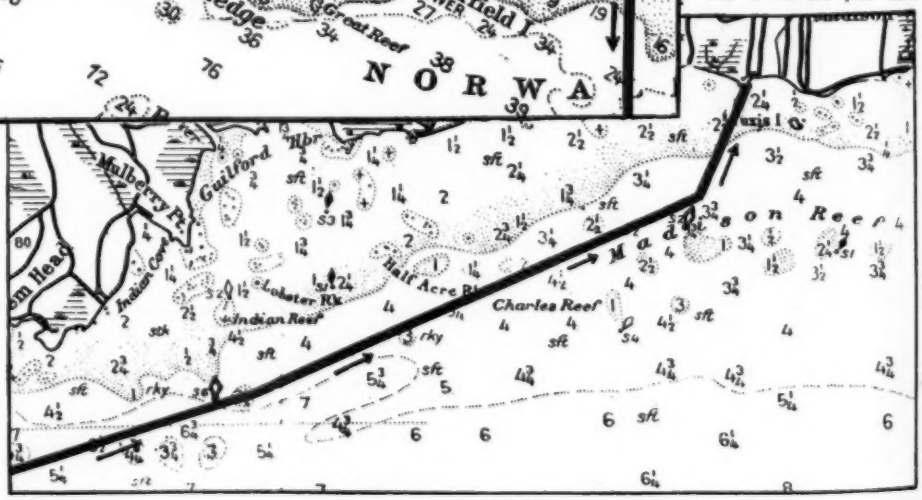


Fig. 109 (at the right)—*Another example emphasizing the imperative use of charts and not relying solely on the coloring of the buoys. In entering Madison Harbor red spar, No. 6, is left to port, while red spar No. 2, is left to starboard. Should either of these buoys be passed on the improper side the ship will go high and dry*

Types of Sailing Vessels You Will Meet

Diagrams to Simplify the Classification of Sailing Vessels, Their Sail and Spar Arrangement

MoToR BoatinG's Correspondence Course in Piloting, Seamanship and Small Boat Handling—Lesson No. 4.

Fig. 110— Cat boat, a small beamy vessel with a single fore and aft sail

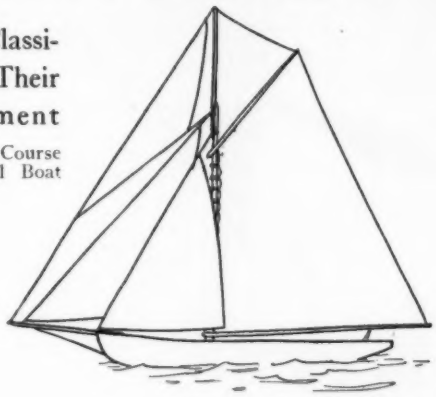


Fig. 111—Sloop, a single masted vessel, carrying one or more head sails and usually a top sail

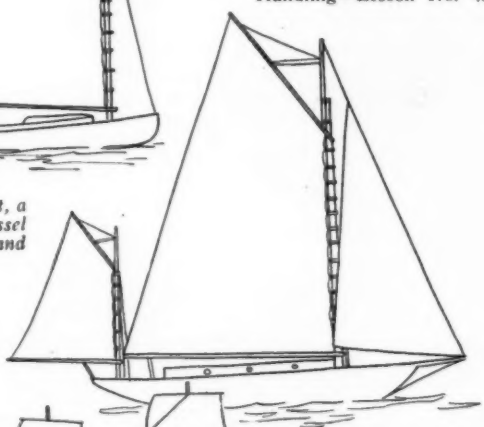
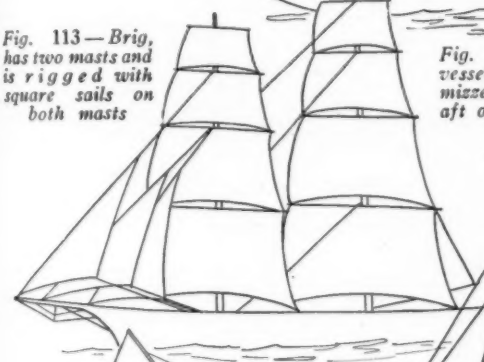


Fig. 112—Yawl, a vessel carrying a mizzen mast stepped aft of after water

Fig. 113—Brig, has two masts and is rigged with square sails on both masts



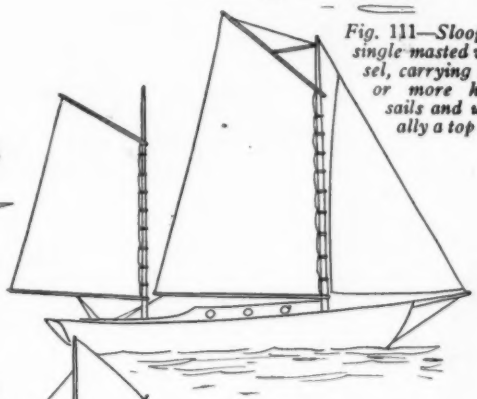
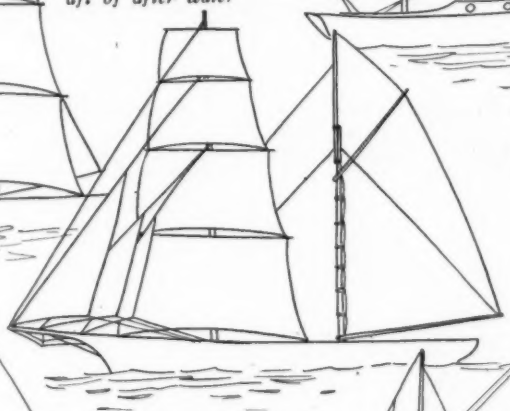


Fig. 114—Ketch, a vessel similar to a yawl except that mizzen mast is stepped forward of after water line



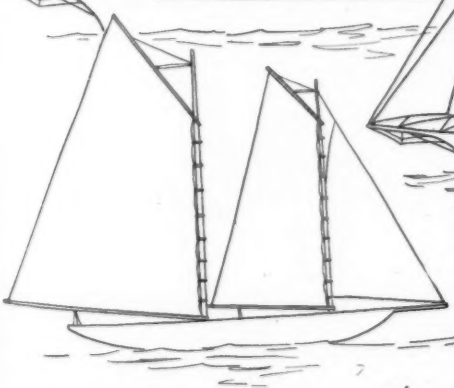


Fig. 115— Brigantine, is similar to the brig except that the sails on the main mast are fore and aft

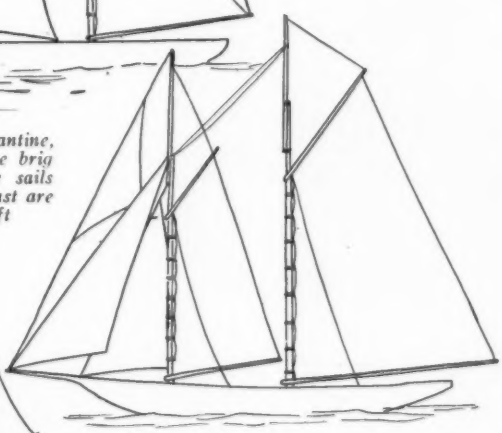


Fig. 116—Schooner, is a vessel with two or more masts all fore and aft rig

Fig. 117—A topsail schooner is similar to a schooner with the addition of a single yard for square sail on foremast

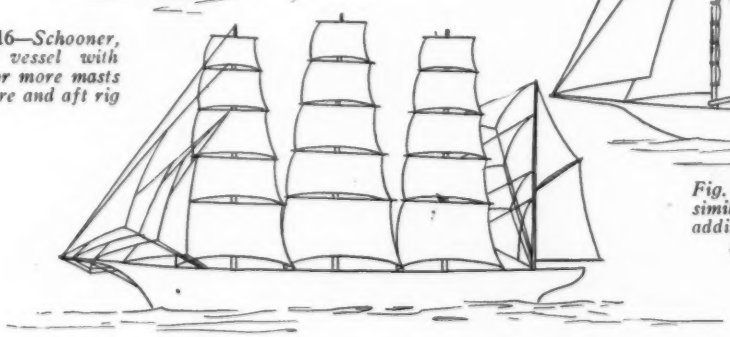
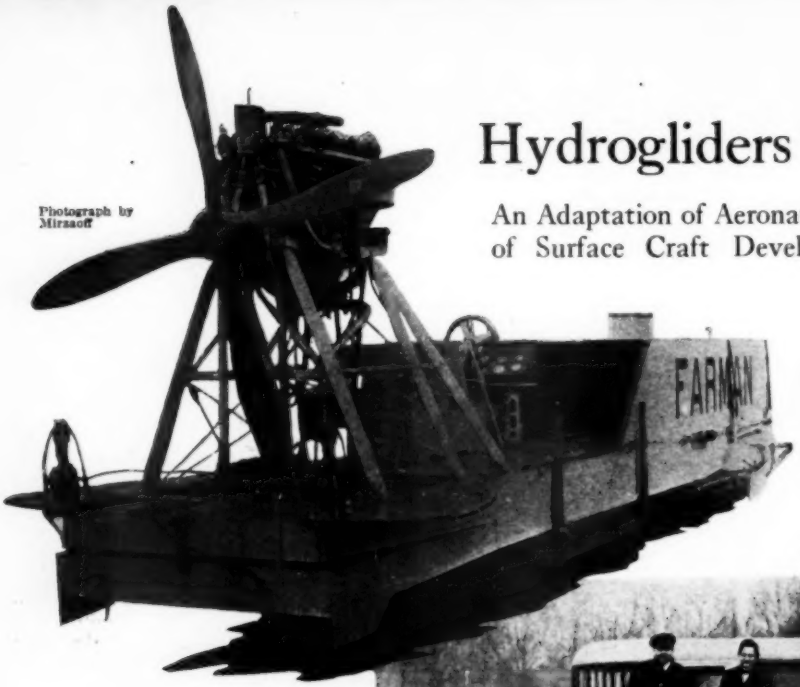


Fig. 118—Bark, a vessel with three or more masts, square rigged on all except the after mast, which is fore and aft rigged. A full rig ship has three or more masts, square rigged on all

Hydrogliders Popular Abroad

An Adaptation of Aeronautic Principles to the Propulsion of Surface Craft Developed by European Designers



Photograph by Mirsanoff

The propulsion equipment of the Farman Hydroglider consists of a powerful airplane engine driving a tremendous four-bladed propeller as shown. The speed attained by this combination is said to be 90 kilometers per hour. This is equivalent to 56 statute miles per hour, not particularly fast for the horse power expended

International Photograph

Another adaptation of the air propeller is shown in the De Lambert Hydroglider which broke a record for the varsity course on the Thames at London. The airplane motor used develops 250 h.p., and the craft draws only 2½ inches of water

Henry Farman, the aeronautic engineer, uses one of these gliders on the Seine River to transport him to and fro. Traveling at a mile a minute on one of these gliders does not seem to be a very comfortable way of getting about

Photograph by Kadel & Herbert

The particular advantage of this type of craft is its ability to travel rapidly in very shallow water. A goodly number of persons can be carried on these boats at high speed. A competition was held in France with this type of craft which was practically a free-for-all event. Speeds attained are not reported

Photograph by Mirsanoff

SMALL MOTOR BOATS

Their Care, Construction, and Equipment

A Monthly Prize Contest Conducted by Motor Boatmen

Questions Submitted for the July Prize Contest

1. What method would you pursue to protect your deck from weather, and prevent swelling and shrinking with the opening of the seams incident thereto?

(Suggested by H. A. H., Baltimore, Md.)

2. Describe and illustrate the best way to keep a number of tenders at a yacht club float.

(Suggested by J. B., New York, N. Y.)

3. How would you rig an awning on an auxiliary, so that it may be easily set and stowed?

(Suggested by E. L. C., Cambridge, Mass.)

Rules for the Prize Contest

ANSWERS to the above questions for the July issue, addressed to the Editor of MoToR BoatinG, 119 West 40th St., New York, must be in our hands on or before May 25, (b) about 500 words long, (c) written on one side of the paper only, (d) accompanied by the senders' names and addresses.

The name will be withheld and initials used.

QUESTIONS for the next contest must reach us on or before May 25. The Editor reserves the right to make such changes and corrections in the accepted answers as he may deem necessary.

The prizes are: For each of the best answers to the questions below, any article or articles sold by an advertiser advertising in the current issue of MoToR BoatinG of which the advertised price does not exceed $25, or a credit of $25 on any article which sells for more than that amount. There are three prizes—one for each question—but a contestant need send in an answer to only one if he does not care to answer all.

For answers which we print that do not win a prize we pay space rates.

For each of the questions selected for use in the following month's contest, any article or articles sold by an advertiser advertising in this issue of MoToR BoatinG of which the advertised price does not exceed $5, or a credit of $5 on any article which sells for more than that amount.

All details connected with the ordering of the prizes selected by the winners must be handled by us. The winners should be particular to specify from which advertisers they desire to have their prizes ordered.

Why Motor Boating Is the Most Popular Sport

Many Reasons Advanced Why Motor Boating Should Be Counted As the Best and Least Expensive of All Sports

Answers to the Following Question Published in the March Issue

"Why do you consider motor boating the best and cheapest of all sports? Give your reasons why motor boating should be more popular and why more people should own motor boats."

Makes Us Better Citizens

(The Prize-Winning Answer)

THE question as put—"Why do you consider motor boating the cheapest of all sports?"—cannot be answered directly, because I am reminded immediately that the sport of rocking a chair on a clubhouse veranda, or, if I may be pardoned the digression, of holding hands in a conservatory, is cheaper. But motor boating is infinitely more enjoyable than either of these pastimes, or at least may be indulged in by more than two persons with greater satisfaction to all concerned.

Moreover, motor boating may be as cheap as the individual wants to make it. As compared with motor cycling, for instance, which is a penance rather than a sport, boating in a motor canoe gives as great a gasoline mileage, and, since there is no tire expense, may be rated less expensive. Four, five, six, or seven persons, respective numbers which overcrowd various types of four, five, six, and seven passenger motor cars, may be comfortably accommodated in a day cruiser whose operating cost per mile is less than that of the lowly Ford. With motor boats there is not the incentive to spend money that obtains along Automobile Row, and almost invariably a man buys what is commensurate with his needs and his pocket-book rather than what will excite the envy of his neighbors.

More persons—keeping strictly to the text of the question—should own boats than now do because each boat gives its owner a chance for individual expression. He may make his craft reflect his own character, and it is generally true that a boat-owner is judged by the neatness, shipshapeness, and handiness of his boat. Ownership of motor boats should be more widespread because it makes for a broadening of various kinds of useful knowledge, such as piloting, mechanics, and carpentering, while on the esthetic side, familiarity with the sea in all its whims and phases acquaints a man with his soul beyond advance calculation.

Motor boating should be more popular, the arguments have been used before, but they are still just as pertinent because the sport is clean, dust-free, and exhilarating, and the devotees of it have exceptional opportunity to develop their ingenuity, resource, and self-reliance. Occasionally it is given to them to succor the distressed which, according to Biblical precept, is laudable and not infrequently they must come face to face with themselves and find out exactly what stuff they are made of—to what degree they are courageous and dependable in an emergency.

Above all, motor boating should be more popular because the sport combines a minimum of expenditure with a maximum of independence, a minimum of fatigue with a maximum of downright enjoyment; and because the people who go down to the sea in boats and who live along its shores are generally better citizens because of their close acquaintance with nature. A. F. L., Huntington, N. Y.

An Invigorating Sport

ENVIRONMENT plays as important a part in characterizing a sport as it does in influencing a business, trade, or occupation.

At the outset, motor boating has an appeal that arises from its natural setting. It affords a distinct departure from our terrain monotony in a medium which, by its contrast stimulates imagination and interest.

In his ordinary movements by trolley, train, taxicab, or motor car, a man considers mainly the rate at which he must go. The method he selects and the manner of his riding or driving are so established and conventional that he is inert to the few remaining thrills or novelties that the trip may afford. Our customary transportation is just a matter of Let's Go, with all the emphasis on the Go.

There are, of course, scores of hobbies, games, avocations, and pastimes practised on land which afford relief. health, and strength for both mind and body, but the environment at best becomes too settled and familiar for maximum enjoyment.

As soon as one embarks in a motor boat, conditions of

change and contrast arise. Nature's complete panorama unfolds, bringing with it new scenes, thrills, difficulties, and dangers in such degree and combination as to render terra firma conspicuous for its limitations. The duties and responsibilities of a motor boat pilot, while not unduly tedious or exhausting, bring into play new nerves and muscles in an atmosphere that is always invigorating. Every sense becomes keener as the restless deep alternately stirs and soothes his imagination and energy. It is no longer just a matter of Let's Go, but rather Let Us Go, because motor boating awakens latent human and personal characteristics far deeper than the mere spirit of getting there or winning which dominates so many of our pastimes on land.

Motor boating surpasses sailing or rowing as driving an automobile contrasts with motorcycling or bicycling.

Because it is basically so delightful and different, motor boating has gained in popularity each year, notwithstanding that increased costs of boats and fittings, operation, maintenance, repair, and storage expenses, and taxation and legislation have, at times, been of a decidedly retarding nature.

Not all of the factories and dealers engaged in the industry have been willing to do their share of constructive sales and service effort. Some of the boating clubs have been too aloof and reserved to more than skim the realm of potential members in their districts.

Except where geographically impractical, the man who owns even the smallest motor car can be persuaded to invest in the smallest motor boat after he is convinced, by sufficient advertising, personal solicitation, and demonstration, that motor boating is a sport surpassingly enjoyable and inexpensive as well. It can be shown why it is inherently so and unlike a motoring party, for example, which frequently entails added entertainment, dining, refreshment, and lodging expense, which items beckon the motorist at every turn of the congested road.

Literally millions are waiting to be shown the quantity and quality of diversion and pleasure that only motor boating affords at a moderate expenditure. Those already interested in the business or the sport must advertise, sell, and boost the sport at every opportunity, for their own as well as the public's benefit. Motor boating makes its strongest appeal as a real sport, not as a means of transportation, a speed mania, style or culture display, or a game, and no matter where you are, you can spread the gospel of it along the lines of its inherent satisfaction.

D. McC., Cleveland, Ohio.

An Economical and Wholesome Sport

THE sport of motor boating falls naturally into five divisions: 1—building; 2—operating; 3—racing; 4—cruising; 5—maintaining or tinkering. Each has its separate appeal, varying in degree according to individual preference. But common to all phases of the sport are a number of peculiar qualities which raise it above the plane of other sports and make it supreme. For example:

1. A universal sport.
   a. Geographically. No state in the Union is without motor boats in some form. States bordering on either coast or the Great Lakes afford opportunities for using all types and sizes of craft on all types of water.
   b. Socially. A sport for all classes (except the very poor). The price range is far wider even than for the automobile. Even within the membership of some clubs we find a crowd of good fellows differing widely in their possession of worldly goods. It promotes democracy and fellowship.
2. A wholesome sport. Motor boating keeps one out in the clean open air and fills the lungs with ozone tonic instead of dust. It provides a relaxation from mental cares that at the same time stimulates the mind and builds stronger bodies. It gives one a chance to get close to nature and study life.
3. An economical sport. It is true that men of moderate means cannot indulge in high speed racing or large express cruiser operation. But motor boating is not limited to these classes. It includes the power canoe, the open runabout, the family cruiser. Such boats can be built, operated, cruised in, maintained and yes, raced with (by classes) at a surprisingly low cost. This is particularly true when the owner does his own work about the boat, which is really sport.
   Boats depreciate in value much slower than automobiles, and a $1,000 boat costs less to run and keep in repair than a $1,000 car.
4. An independent sport. Motor boating gives one a freedom like nothing else. There are no congested thoroughfares, no bad roads to avoid, no traffic regulations, except the simple rules of the road. When you cast off from your mooring only the limits of the seven seas (and your own time) confine you.
5. A character building sport. No man can build a boat, operate it for himself and friends, conquer obstacles of wind and wave, (mixed with the occasional spice of danger) alter and improve his accommodations or speed, without growing bigger by so doing. It is, on a lesser scale, like building a successful career, and shaping one's course to the goal of achievement.

The particular attractions found in the five branches of the sport mentioned above contain the following high spots:

1. Building. The satisfaction that comes especially to one handy with tools, in fashioning with his own hands something practical, useful, and something in which he may justly feel pride of possession.
2. Operating. The joy of giving pleasure and recreation to others and to oneself in a simple, healthful, inexpensive way.
3. Racing. Motor boats provide a vehicle for exercising skill, nerve, judgment, and the joy of conquering by the display of each.
4. Cruising. The joy of the simple life close to nature plus the exhilaration of exploration and adventure. All the fun of camping without the uncertainties of camp sites and the intentions of outsiders.
5. Maintaining. The contentment found in working out improvements in power plant or fittings; the pride of owning the best-kept craft in the fleet; the pleasure of proving a pet scheme or device and displaying it to the rest of the bunch.

Motor boating is a real and live sport in which every real and live American may indulge with pleasure and benefit.

B. B., Larchmont, N. Y.

Spares and Tools, How to Carry Them

Complete Assortments of Tools for the Average Boat, Engine, Reverse Gear and Accessories to be Kept on Board

Answers to the Following Questions Published in the March Issue

"Give an itemized list of tools and spare parts for the average four-cycle engine, reverse gear and accessories to be kept on board. What arrangement is best for storing them?"

Necessary Tools and Supplies

(The Prize-Winning Answer)

IT would have been quite easy to have written out a list of the tools and supplies that would seem to be needed on the average motor boat with a four cylinder engine to keep in repair, but as I began to think about these tools I wondered just what had been accumulated on my own boat in the way of tools and supplies during the past five seasons. Finally I decided to go down and look the stuff over and the list submitted is practically the result of that investigation. There seems to be quite a lay out

but they are all things that have been supplied from time to time because they were needed. Of course a number of the tools could be dispensed with where the owner confined himself merely to necessary adjustments but with this outfit we consider ourselves equipped to make any minor repairs that might possibly be needed. This is particularly necessary on a cruiser where a slight accident to some part of the machinery might put the power plant out of commission while far from assistance.

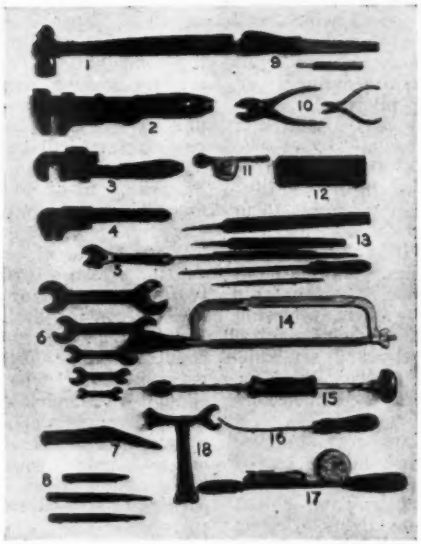
Machinists have found that the best arrangement for keeping their tools is in a chest of small drawers. This style of tool box is rapidly taking the place of all others. It provides an arrangement where the tools of each kind or class have their own separate compartment, and as the drawers are shallow there is no piling tools in on top of each other until you can't see what is in the place.

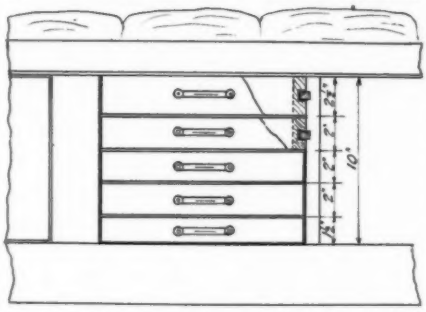
The machinist's tool box would be impractical on most small motor boats but the idea is a good one and could easily be taken advantage of by building the drawers into the regular locker provided or used for storing the engineer's tools. These drawers should not be over two inches in depth, some of them may be even less. Three or four of these drawers with a width across the front of about twelve inches and a length back under the transom seat of from twelve to eighteen inches will be sufficient to take in the longest tools and provide plenty of space for everything needed. One or two partitions dividing the interior will also prove of advantage. In the cabin boat a good location for these drawers would be under the transom seat at the after end of cabin as near to the engine as possible. On open boats the drawers may be built into any available locker but the fronts should be set back about an inch and a door or loose panel provided; that may be closed and locked, securing all the drawers with one operation.

Where sufficient depth can be obtained, a front space of twelve by nine inches will provide sufficient storage, but should the locker be shallow, as might occur under the narrow side seats in an open boat, then they should be about eighteen inches across the front end of whatever depth the space will allow.

The tools shown in the print and the list that follows are those that have been provided as required from time to time. A few of the items may not be found on the average boat, for instance, No. 15. This tool was used to drill the 4,000 holes through the hard white oak frames for the plank fastenings. It has proven to be one of the handiest tools and has been used many times. With it we can drill out a broken screw, make a hole for a taper pin or do many other jobs.

No. 11 is also considered a necessity. This is used for counting the pulse of the engine in order to see if she is feeling and behaving just right.





Tool equipment and type of tool chest which C. H. C. finds best

No. 1—ball pene hammer; 2—12-inch monkey wrench; 3—10-inch pipe wrench; 4—9-inch motor boat wrench; 5—6-inch open end adjustable wrench; 6—set of thin open end wrenches from ¼ to 1 inch; 7—special key drift for flywheel; 8—chisels and punches; 9—large and small screw drivers; 10—two pair of pliers; 11—speed indicator or revolution counter; 12—oil stone; 13—assortment of files; 14—hack saw; 15—Goodell Pratt reciprocating drill with assortment of drills to ¼ inch; 16—bearing scraper; 17—soldering outfit; 18—special wrench for reverse gear.

There is also a very small pair of tinner's snips for cutting sheet metal and a few taps of the sizes and threads of the small screws mostly used on the motor.

A small vise of the kind that can be attached to the bench with a thumbscrew would also be a very useful tool on board as small parts could be held to better advantage for filing or sawing.

The supplies for the motor consist of some extra spark plugs, a piece of asbestos paper for gaskets, a small assortment of set screws and machine screws of the sizes used on the motor and parts, a few taper pins and cotter pins, some candle wicking and a small can of tallow used for packing the pump stuffing box. Grinding compound for the valves and some short sections of radiator hose of the sizes used for connecting the exhaust and water pipes. Spool of copper wire and two or three pounds of genuine babbitt metal. This last item we have never had occasion to use but if a bearing should ever burn out, we can make repairs wherever we are, with a granite cup and a Primus stove for melting the metal. There is also a couple of extra valve springs on board although so far we have never broken one.

C. H. C., Saginaw, Mich.

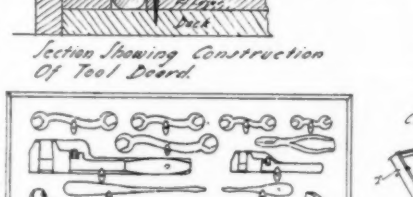


Fig. 1. Tool Board of two Layers, Outside Layer Cutout to Outline of Tools.

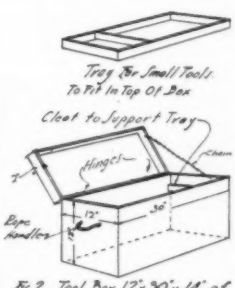


Fig. 2. Tool Box 12"x30"x14" of ½" White pine with Shallow Tray for Small Tools.

Tool chest with shallow tray arranged to hold tools firmly in place suggested by A. G. W.

Complete List of Spares

THE hardest thing about listing the various items of tools, spare parts and accessories is to know when to stop. The following is a very complete list of the articles that would be carried on a well-equipped cruising boat. Of course in making up your list some of the items will be omitted, for example, if you have a coal stove you would not carry an oil stove burner or if the engine had a solid head cylinder head gaskets would not be listed. The items in paragraph four would only be carried if going on extended cruises far away from machine shops. You may think you will never use certain things listed; let us hope not, but there is nothing like having something when there is no other place to get it from. The space of this article does not permit describing the uses of the various items but they may all come in handy some time; it's just like insurance.

Anchors, anchor ropes, deck lines, fenders, a good old-

fashioned three-inch galvanized iron pump which will pump when you want it to, a fair sized liquid compass, binnacle, lead and line, whistle, fog horn, running lights consisting of bow, stern, and side lights, fire extinguisher, charts, coast pilot, two copies of the pilot rules, flash light, deck mop, boat hook and two oil cans of different style, one for oil and one for gasoline.

Twenty-four inch, twenty-inch and a ten-inch Stilson wrench, eighteen-inch monkey wrench, eight-inch adjustable open end wrench, set of open end S wrenches to fit motor, any special wrench that belongs to motor, magneto wrench, ten-inch and sixteen-inch screw driver, electricians' pliers, an assortment of flat and round files, platinum point file, center punch, ball hammer, bronze hammer, cold chisel, steel punch for cutting holes in gaskets, soldering iron, gasoline torch, hand drill and a few drills, claw hammer, ¼-inch and 1-inch wood chisels, nail set, rule, square, rip and cross cut saws, brace and a few bitts, caulking iron, putty knife, a few paint brushes, sail needles and a sailor's palm.

Crank pin connecting rod bushings upper and lower halves, wrist pin, wrist pin bushings, and half a set of piston rings for the whole motor.

Tiller rope, washers and valve parts for water closet, a fount, burner and wicks for running lights, electric bulbs, fly paper tapes, pair of oars, two pair of row locks, with sockets, a few pieces of ⅞-inch board, a few pieces of galvanized sheet iron, two pounds of each of two-inch and three-inch galvanized wire nails, a pound of each of one and one-half inch and two and one-half inch galvanized iron finishing nails, one pound of copper tacks, an assortment of brass or galvanized wood screws, a few assorted pieces of canvas for patching a hole or serving a chafing anchor line, five pounds of dry red lead, quart of linseed oil, one pint of japan dryer, five pounds of linseed oil putty in a can with a bit of water on top, it will stay soft as long as the water is kept there, can of engine paint, roll of electricians' tape, strip solder, soldering compound, valve grinding compound, square flax packing for stuffing box and pump, pint of shellac, can of graphite paste consisting of graphite and cylinder oil to put on studs, nuts or cap screws to prevent them from rusting fast, ball of lamp wick, ball of asbestos wicking, ball of black marlin, ball of heavy cotton thread, piece of beeswax, can of medium and can of hard Albany grease, five pounds of nonfluid oil for clutch, quart can of fire extinguisher liquid, gallon of kerosene oil, gallon of cylinder oil, one pound of caulking cotton, extra burner or burner cap for pressure stove, atomizer wire for cleaning burners, two or more feet of ¾-inch and 1-inch rubber hose, bulbs and battery for flash light, six strips of tin ⅜ x 3 inches for removing piston rings, a few extra exhaust and water connection pipe fittings and nipples, spool of 18 gauge galvanized steel wire, ten feet of 8 gauge galvanized wire, enough high and low tension wire to rewire entire motor, heavy wrapping paper to make shims or casting gaskets, a few extra cap screws, studs, nuts, cotter pins, lock washers, and unless you have a very reliable storage battery carry an extra set of dry batteries, extra electric switch, springs for timer and magneto, extra valve, valve cage and spring, extra set of spark plugs, thin sheet metal pattern of cylinder head gasket, sufficient asbestos packing with the copper wire screen in it to make a new set of packings, cylinder head gaskets, inlet and exhaust manifold gaskets, valve cap gaskets, several sheets of emery paper, a can of brass polish and some elbow grease.

A box similar to the tool box shown on Fig. 2 is a very fine thing in which to store all the small parts provided there is room for the box, otherwise put them in a dry locker.

For the tools used often around the engine if you have the space, a tool board, Fig. 1, is a very neat arrangement,

Ventilation Between the Frames

Solution for the Problem of Preserving Woodwork from Dampness in Enclosed Spaces

Answers to the Following Questions Published in the March Issue

"Explain and illustrate a satisfactory method of ceiling the cabin of a cruiser so as to allow ventilation between the frames."

Ceiling the Cruiser Cabin

(The Prize-Winning Answer)

THE flooring should run up to the face of the frames, not notched around them. This will leave a space for air to come up from the bilge. Starting the ceiling lumber on top of the floor, fastening at each frame, and continuing upwards, will continue this air passage up to the top between the frames. According to the construction at the top, the ceiling lumber is to continue to the clamp, or stop one inch below it. See Figs. 1 and 2.

Fig. 1 having open clamp, the ceiling runs up to it, as the top, for the thickness of the deck beams, will be open for outlet to the air passage. Fig. 2 has filler blocks back of the clamps, closing off the air passage, so the ceiling will stop about one inch below the clamps to make an outlet,

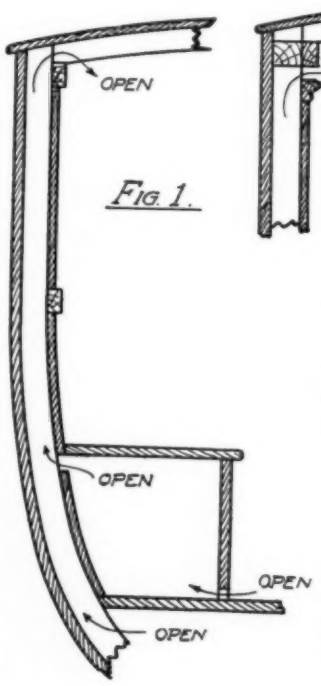


FIG. 1.

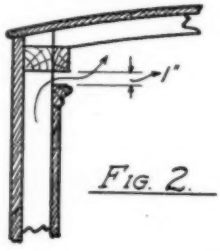


FIG. 2.

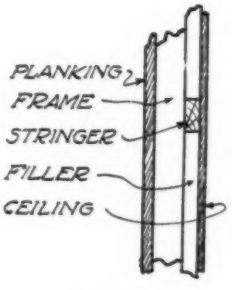


FIG. 3.

Ventilation openings are provided for in the construction of the boat according to the method devised by L. R. K.

and also to have a better appearance the top strake is a molding similar to that shown.

If any stringers occur part way up, blocked up in back with fillers as the top of Fig. 2 shows, which close off the air passage, there should be a one-inch space left top and bottom of the stringer to make an outlet and inlet to the air passage. In place of this space, one-inch holes can be bored about three inches apart, although the continuous space is preferable.

If you do not want stringers to show part way up as in Fig. 1, fill out the frames so that the ceiling material will be flush, or entirely cover the stringer. This is shown in Fig. 3.

If a port light has blocking in back of it that closes off the air passage, bore some one-inch holes in the ceiling above and below it to make air passage way. These holes don't look very nice, so it will be better to remove some of the blocking to open up the passage to some extent.

If there are locker seats along the sides, air circulation is provided as Fig. 1.

At the floor line, or several inches above it, provide a slotted opening one inch high, to form an inlet. This is in the front of the locker. At the back, at the top, or as near as the seat construction permits, stop the ceiling material for one inch to make an outlet into the air passage.

Before applying the ceiling, give the parts to be covered a good coating of some anti-rot preparation such as carbolineum, etc., as this surface will never again be open. Bear in mind if using carbolineum that it may soak clear through lumber that has not been painted on the other side: that is, don't paint the inside of the planking with this, if the outside has not been painted, or you may have trouble.

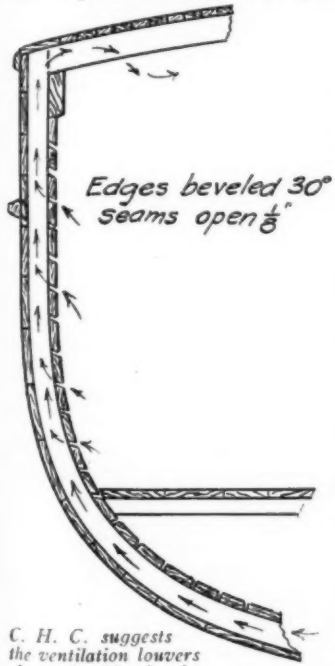
For the lumber, I prefer the V cut stock in preference to the beaded ceiling, and then if finished in white enamel with any moldings stained mahogany, and the deck beams mahogany too, you will have a bright, cheerful cabin.

L. R. K., Phila., Pa.

Ventilation Preserves the Boat

THOROUGH ventilation is the great secret of making the boat last. When we say thorough we mean every least part. There is really not much use in ventilating eighty or ninety per cent of the boat and then leaving some small spaces here and there unprovided for. If there are any small parts of the hull that you think will not be needed after awhile, why just box them in tightly and the heat and dampness will start the destructive work immediately.

Recently we had occasion to make repairs on a small open launch. This boat had not been ventilated below the floor with the result that everything was pretty well gone below the floor line, while the top sides ceiled with narrow strips laid with ⅛ inch openings between each piece was practically sound with one exception. This was where a locker had been built across the boat. Here the ventilation had been cut off and the boat was gone for two rib spaces from the bilge to sheer strake. An object lesson on the result of cutting off small unventilated pockets.

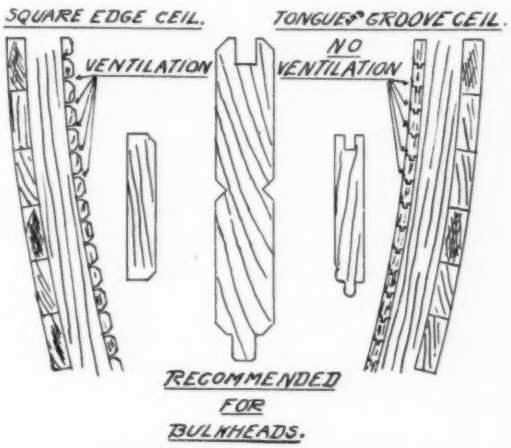


C. H. C. suggests the ventilation louvers shown in this sketch

A plan that is frequently followed with the idea of ventilating the spaces between the frames of cabin boats is to leave an opening above the upper clamp so that air circulating or forced below the cabin floor will pass up between the frames and out at the top between the carlins. The greatest defect in this plan is that there are likely to be numerous butt blocks that will cut off the circulation of air in many of these spaces. Also there are the port lights that will each close either one or two spaces.

To overcome this difficulty a plan is suggested with slight changes for ceiling the cabin that has been used successfully on many open boats. It consists of using 2-inch strips with the corners nicely rounded and laying these strips with ⅛-inch opening between edges. While this plan has proven entirely satisfactory in open boats where the ceiling is usually finished in natural wood, in the cabin where the finish is frequently white enamel, there would be a possibility of the frames or planking showing through, and spoiling the appearance of finish. To overcome this objection it is suggested that the edges of the ceiling pieces be beveled about 30 degrees and then laid with about ⅛-inch opening with the edges overlapping each other somewhat after the fashion of the old-fashioned shutters or wooden blinds, so that from all ordinary angles of vision of a person in the cabin the seams would not show through. With this plan, air can circulate through the ceiling at any point and will also assist in ventilating the bilge, although air should be forced to this part of the boat through a cowl ventilator on deck, and suitable piping or passages for conducting it below the floor.

C. H. C., Saginaw, Mich.



W. B. M. compares the advantage of ventilation with the un-ventilated hull

Ventilating Between the Frames

WHETHER finishing a new boat or reconstructing and repairing an old one, ventilation, not only of the cabin and engine room, but of the space between the frames and other closed corners, is of considerable importance. These unventilated and more or less damp spaces are the most likely spots for dry rot, the greatest natural enemy of wood when used in damp but not wet places.

Dry rot is a fungus growth and moisture is essential to the propagation of the spores, for then they spread in all directions, destroying the wood by reducing it to a dry brown powder. Dryness does not destroy the fungus, although it is inactive so long as the timber is dry and decay ceases. A peculiar circumstance in connection with the progress of dry rot is that, although moisture is essential for the growth of the spores, wood which is continually immersed seldom becomes affected. The constant saturation of the wood prevents the development of the spores. The first appearance of dry rot shows as a thin white film which gradually thickens at its center and turns to a rusty brown. Its last stage is a dry brown powder, leaving only the surface intact. Dry rot is generally believed to be a chemical change in the wood, brought about by insufficient ventilation, but it is not. Damp, close air hastens its progress, moisture is essential to its growth and it is inactive when the wood is dry. The spores of dry rot hide away in the air checks in the ends of the timber as it seasons and develops or lies dormant as conditions permit. Standing timber is sometimes attacked by a fungus growth and is unsound when cut.

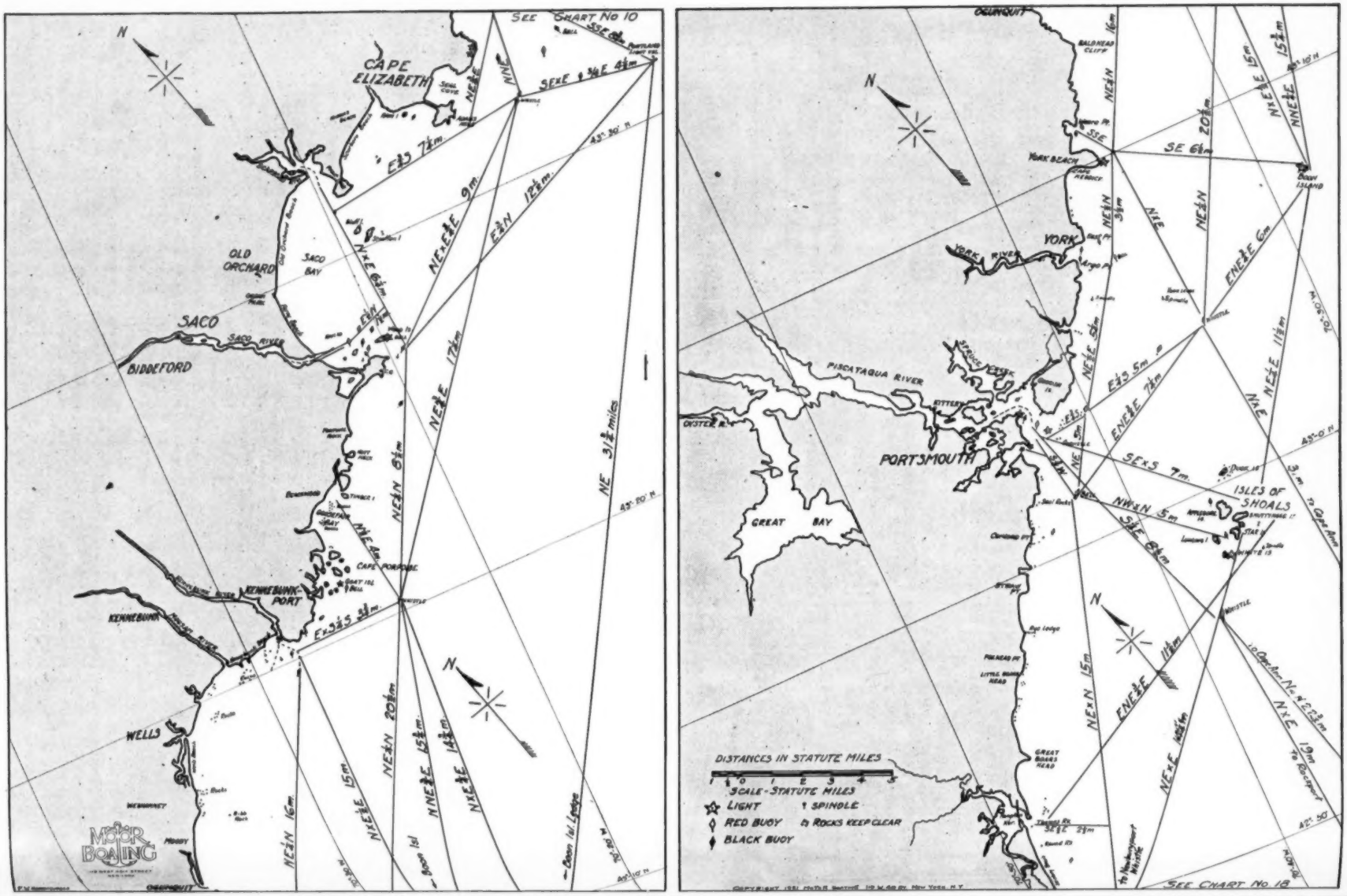
The above is conclusive evidence that dry rot flourishes in close damp air, and it would also seem a convincing argument for ventilation between the frames, and elsewhere in motor boat construction.

The usual method of ceiling cabins and constructing lockers with tongue and groove stock should have become obsolete years ago as it allows no ventilation, is hard to apply, and is generally beaded, which bead fills up with paint and dirt. The most practical material for ceiling cabins and locker construction is square edge V groove stock which when properly applied, always allows ventilation between and behind each strip is much easier to

(*Continued on page* 54)

Motor Boatmen's Chart No. 19—Massachusetts Coast, Newburyport to Cape Elizabeth

Use in Connection With Coast & Geodetic Survey Charts Nos. 1204, 1205, 1206, 228, 229, 327, 330, 331 & 0329

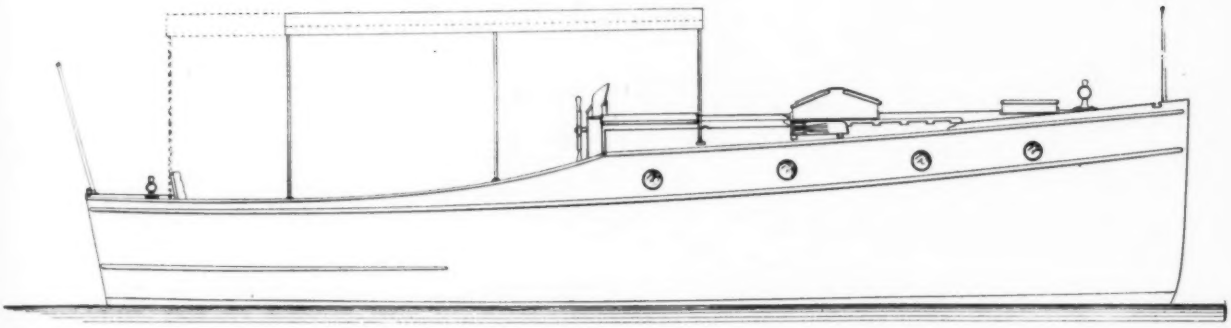


How to Build Dolphin, a Tunnel Stern Cruiser

An Unusual Design for a 34-Foot Shallow-Draft Cruiser With Complete Details and Specifications for Building

Designed by Wm. J. Deed

Exclusively for MoToR BoatinG



Outboard profile for the 34-foot shallow-draft cruiser Dolphin

IN the February issue we presented designs and complete specifications and building instructions for a 34-foot cruiser drawing 3 feet which can cruise anywhere. But many sections of the coast will not afford safe boating for a cruiser drawing 3 feet, in fact many miles of beautiful cruising ground or, should we say cruising water, is only 3 feet deep and in order to enjoy boating there a man should feel that he has about a foot between the keel and the bottom. There is usually little danger in striking in shoal waters, mostly inconvenience due to having to get out and push and the delay and inconvenience of laying on the mud over a tide. However, there are other sections where going aground in shoal waters is fraught with the possibility of having a bad sea kicked up by a strong wind and consequent danger to the boat. Many pretty cruising shoal waters are reached only after a trip over fairly deep, rough waters and a boat that is planned to just skim along on the surface usually is not safe or comfortable on the rough part of the trip; and the deep-draft boat that would be ideal for a rough trip is too deep to permit entering the shoal waters. So we present in this issue of MoToR BoatinG a real cruiser that is a compromise. She is developed from Nomad because the general appearance and arrangement of that popular craft has appealed to so many. Those who liked Nomad but found her draft too great for their use will find in Dolphin a craft they can enjoy. We are later going to publish in this series a design of a very shoal-draft cruiser, one that will not draw over one foot but she will not be a raised-deck cruiser and will not be designed for anything but very shoal quiet waters. Dolphin will navigate any water in which she will float in any weather you will want to be out.

A tunnel stern permits a draft of two feet, the tunnel being constructed as simple as possible with straight sides and flat top rather than being an arched tunnel designed with arcs of circles. No mast is provided because in most shoal waters bridges or overhanging trees abound and a mast is only in the way. Many beautiful cruising spots of shoal draft are in the South and the average khaki awning is little real protection from the sun. In tropical climates all awnings on steamers and boats are double and afford considerable relief from the heat of the sun. Also there are few satisfactory awnings from the standpoint of watertightness, more leak than do not. So why not try a double awning like the one shown? It will be much cooler and more waterproof and costs but little more.

The construction is easily seen. There are many sultry days in northern waters when you could fry eggs on the cockpit floor in spite of an awning over same and so why not a double awning even there? So many want to fish with poles from the cockpit that we have shown a short awning, leaving space for fishing and sockets in deck with stanchions and frame are provided so that an extension can be fitted to provide full-length awning. The stanchions screw into a board crowned to suit top of awning and they are well stepped through deck into sockets on cockpit floor so that this extension to the awning will be strong and safe. Side curtains and an extension seat to form a berth are also provided for the roomy cockpit and there is large space clear for chairs. For day use a dozen people can easily be accommodated in the cockpit. The bridge deck is provided to afford height for the engine and by raising the floor where the helmsman stands slightly above the floor where guests are sitting has the advantage of affording him a clearer view on all sides, an important item in shoal-water navigation. There is 6 feet 10 inches headroom under the awning over bridge deck and 7 feet 6 inches over the balance of the cockpit, so that it should be cool under awning.

An arrangement of hinged and lifting flush hatches over the motor provides good access to that important feature. For simple inspection, priming, changing spark plugs, etc., there is provided the narrow hatch to lift off so that the helmsman is not disturbed or access to the companionway interfered with as is necessary when very large flush sections are opened up. Yet in a

DIMENSIONS GIVEN IN FEET, INCHES AND EIGHTHS. 8-6-2 READS 8'-6 2/8"

TABLE OF OFFSETS 34 FT. CRUISER "DOLPHIN" DESIGNED FOR "MOTOR BOATING" WM. J. DEED HYACK, N.Y.

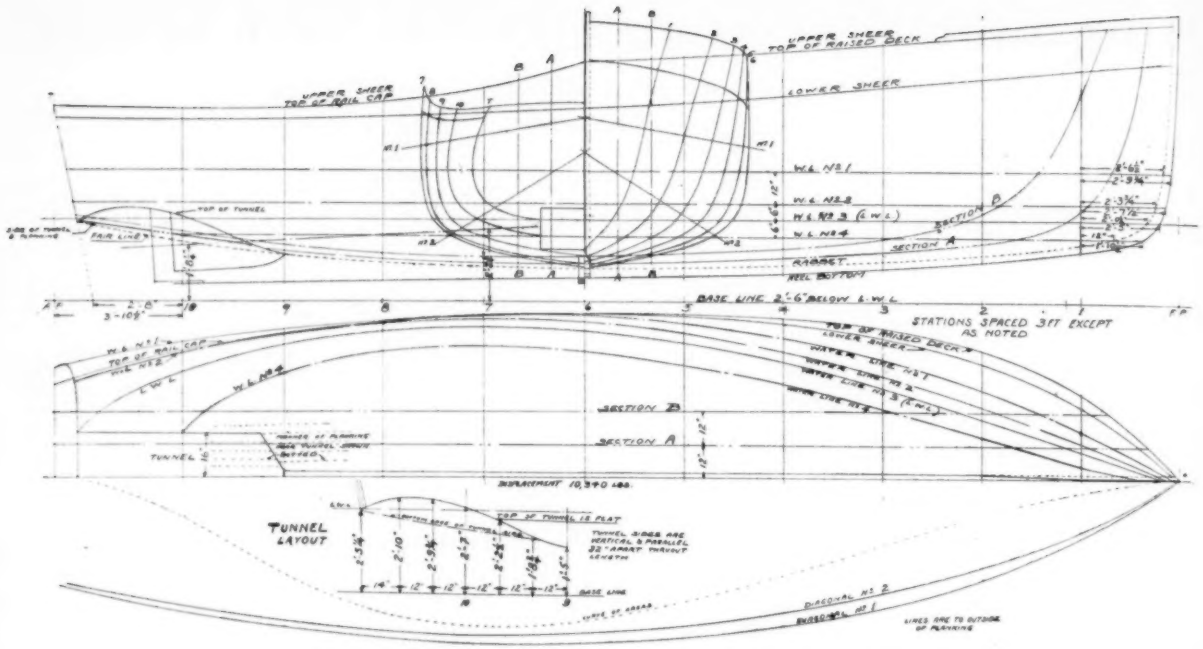
DIMENSIONS GIVEN ARE TO OUTSIDE OF PLANKING

	STATIONS	F P	1	2	3	4	5	6	7	8	9	10	A P.
HEIGHTS ABOVE BASE LINE	UPPER SHEER	8 6 2	8 3 2	8 0 2	7 9 5	7 7 1	7 5 0	7 3 2	6 5 4	6 0 3	5 10 1	5 9 6	5 10 6
	LOWER SHEER	7 3 7	7 0 4	6 9 1	6 6 0	6 3 0	6 0 1	5 10 2	5 8 4	5 7 0	5 6 1	5 5 7	5 6 4
	RABBET		1 9 3	1 5 4	1 2 7	1 1 3	1 0 3	1 0 0	1 0 6	1 2 1	1 4 7	2 6 6	2 4 6
	KEEL BOTTOM		1 6 4	1 2 6	1 0 0	0 10 1	0 9 2	0 8 4	STRAIGHT			0 6 2	
	SECTION A		2 9 4	1 10 1	1 6 1	1 4 1	1 2 6	1 2 2	1 2 2	1 3 2	1 6 1		
	" B		6 2 4	2 8 4	1 11 4	1 8 0	1 5 6	1 4 6	1 4 2	1 5 2	1 8 2	2 1 2	2 7 0
HALF-BREADTHS	UPPER SHEER		2 6 4	3 10 0	4 6 0	4 9 4	4 11 0	4 11 0	4 10 1	4 7 7	4 3 7	3 9 6	2 9 5
	LOWER SHEER		2 2 4	3 5 4	4 2 4	4 7 2	4 10 2	4 11 2	4 10 3	4 8 2	4 4 3	3 11 0	3 0 0
	W L N° 1		1 5 6	2 8 0	3 6 4	4 2 4	4 8 0	4 10 6	4 10 5	4 8 6	4 5 3	4 1 0	3 3 7
	W L N° 2		1 1 2	2 2 4	3 1 0	3 10 0	4 4 0	4 8 4	4 9 2	4 7 3	4 3 4	3 9 0	2 10 5
	W L N° 3 (L W L)		0 9 5	1 10 0	2 8 6	3 6 0	4 0 6	4 5 1	4 6 3	4 4 6	4 0 0	3 2 2	1 6 0
	W L N° 4		0 4 2	1 2 3	2 0 2	2 9 4	3 4 4	3 9 4	3 11 4	3 9 4	3 1 6	1 4 0	
	RABBET	2"	2"	2"	2"	2"	2"	2"	2"	2"	2"	3"	2"
	KEEL BOTTOM	3/8"	3/4"	2"	2"	2"	2"	2"	2"	2"	2"	2"	
DIAGONAL N° 1			1 9 7	3 0 4	3 10 6	4 5 4	4 10 1	5 0 1	5 0 0	4 9 7	4 4 0	4 1 1	3 3 1
" N° 2			1 7 6	2 8 2	3 5 2	4 0 2	4 4 6	4 7 4	4 8 7	4 7 5	4 4 0	3 9 4	3 2 2

DIAGONAL N° 1 INTERSECTS STATION N° 6 - 3 6 6 ABOVE BASE LINE AND STATION N° 4 - 4 6 2 ABOVE CWL

" N° 2 " " " 4 6 6 " " " " W L N° 4 - 4 0 0 OUT

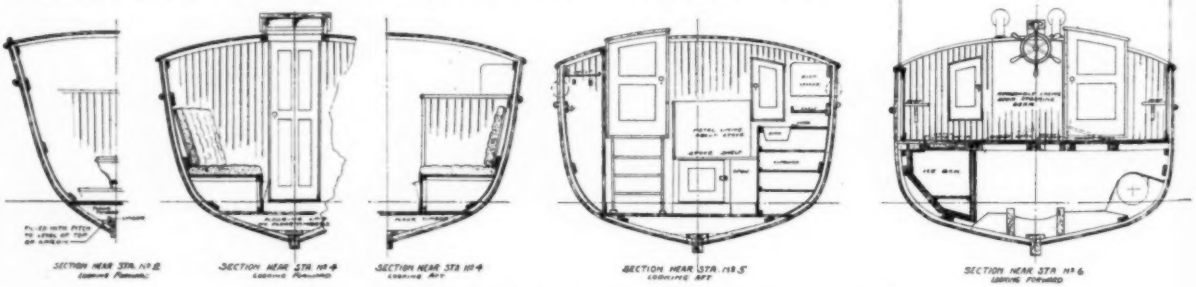
Table of offsets for building Dolphin



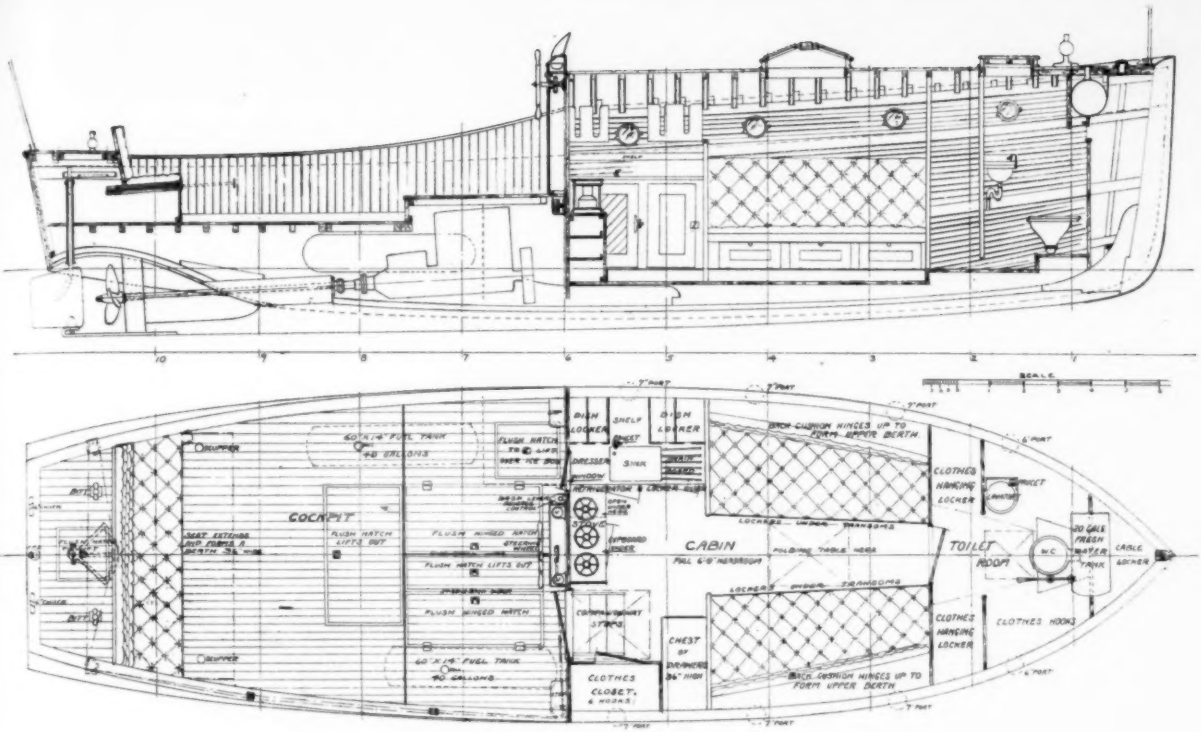
Complete line drawings with details of tunnel stern for Dolphin

jiffy the two hinged sections at either side and the large lifting section over aft end of the motor can be opened and the two strongbacks lifted out for maximum access to the motor. The space provided for the motor is sufficient for many of the motors on the market that are suitable for driving Dolphin and if a higher motor is selected the bridge deck can be increased in height, or if the motor is very high a box can be built over it, shifting the steering wheel to the port side and eliminating the window. The strongbacks are halved into the beams at each end and unsecured so as to immediately lift out. The tunnel has been designed to be as simple in form and construction as can be. The framing for the tunnel is well braced to the cockpit floor and to the hull. The planking in the tunnel should be well steamed and should be in lengths considerably longer than the tunnel so that the boards can be most easily bent in and fastened. The shaft-log end extends through the planking and that should be carefully fitted at that point. In view of the fact that no outboard bearing is provided at the aft end of the shaft-log it would be best to line the shaft-hole with a lead sleeve, this being a length of lead pipe of slightly larger inside diameter, say ¼ inch larger than the shaft, spread, flanged over ends of shaft-log at least ¾ inch and fastened with brass screws. In case the shaft-log is checked or has any split which, however small, might open and allow the water to enter, the lead sleeve will keep the boat free from water entering through the shaft-hole. We do not provide a stern bearing because it is desired to keep the tunnel as clear as possible of all objects and render the flow of water through the tunnel as free as can be. The strut should be fined off above and below the shaft, as much as possible on the leading and following edges in order to reduce eddy-making resistance. The top of the keel at the opening should be well rounded off as indicated but should be square cornered where strut is fitted. A lignum-vitæ bearing is fitted in the strut, which is of white oak. A propeller up to 24 inches diameter can be fitted. A motor of about 20 to 40 h.p., weighing 800 to 1200 pounds, is suitable for Dolphin and the larger of these motors swinging a three-blade propeller 24 inches by 26 inches at about 700 revolutions would drive the boat about 11 miles an hour. The fuel supply of 80 gallons would afford a radius of about 180 miles. The gasoline tanks are placed as high as the arrangement will permit, but many engines have the carbureter located fairly high. If the carbureter is above the level of the bottom of the tanks a pipe should be fitted between carbureter and intake manifold so as to bring the level of the float well below the tanks for gravity feed.

The arrangement and detail is the same as Nomad in the February issue, but with slightly increased width of transoms, etc., because of the increased beam of Dolphin. We went into so much detail in February in describing how to build Nomad and the MoToR BoatinG Handbooks go into such details so completely that it is unnecessary to do so in this article. Constructing Dolphin is not different from constructing other round-bottom raised-deck cruisers, except the tunnel stern. If you lay the boat down carefully, full-size in the neighborhood of the tunnel and draw in the planking, frames, tunnel arch, tunnel framing and planking for each station shown in the detail of tunnel shown on the line drawing, the floor timbers which are located at each frame can be accurately cut to shape so that when they are set up on the backbone formed by the keel, shaft-log, tunnel arch and reinforcing piece attaching the



Forward construction sections for the shallow-draft cruiser Dolphin



Inboard profile and arrangement plan for the shallow-draft cruiser Dolphin

arch to the shaft-log, the aft end of the boat should be so well shaped out that the details will work themselves out. The transom and the molds at No. 9 and No. 10 enable the arch and the two tunnel framing pieces to be bent in and temporarily nailed or clamped to the molds until the floor timbers are fitted, when they can all be permanently fastened together.

In the construction care has been taken to specify all items of the same character, such as raised deck beams, cockpit floor, beams and hatch framing of the same dimensions which will save time and money in getting out these items rather than having them of varying dimensions. Short pieces ordinarily scrapped can be thus utilized where they fit best. One should build Dolphin at a cost of all material and equipment of $1,500, excluding engine.

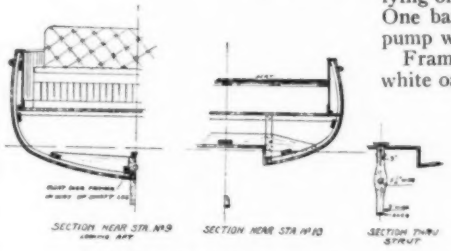
Arrangements have been made whereby those desiring full scale blue prints of the drawings for Chum, Nomad, Porpoise, Shrimp or Dolphin can secure them at nominal cost by addressing F. W. Horenburger, 63 West 184th Street, New York City, N. Y.

SPECIFICATIONS OF MATERIALS FOR DOLPHIN

The completed boat constructed to the following specifications shall measure: Length over all, 33 feet 10 inches; breadth over planking, 9 feet 10 inches; draft, extreme, 2 feet 0 inches. Boat is to be built under cover and shall be fully insured at all times until completion. All material to be first-class commercial quality. No kiln-dried lumber to be used. All galvanized hardware to be of the best hot-dipped quality.

Keel: To be of white oak taken from 4-inch stock, to finish at least 3¾ inches. To be in one piece, molded as per plan. Upper surface forward of strut to be well rounded but to be square cornered at strut.

Keel Batten or Apron: To be of white oak 6 inches x 1½ inches extending from frame 3 to shaft-log. To be secured by bolts securing floor timbers. Before floor timbers are fitted and fastened, keel batten to be nailed to keel between frames. Keel batten to be beveled on under side to suit angle of planking.



After construction sections

Stem and Stem Apron: To be of white oak from 4-inch stock, to finish at least 3¾ inches. Stem to be beveled to face ¾ inch and bound with ¾-inch brass, half-round, secured by brass screws, heads countersunk. Apron to be 4-inch white oak secured to keel and stem by ⅜-inch galvanized rivets as indicated.

Shaft-Log: To be of white oak sided 6 inches, molded 9 inches, bored as required by shaft or sleeve, and secured to keel by six ⅜-inch galvanized iron rods riveted at each end, driven each side of shaft-hole.

Floor Timbers: To be of white oak 1⅛ inches, molded as per plan from under side of cabin flooring or as shown under cockpit to top of keel batten and secured to keel by ⅜-inch galvanized drift bolts and to frames by galvanized boat nails. Bottom of floor timbers to be cut parallel with upper edge. Limbers 1 inch diameter to be bored on each side of center in all floor timbers, timbers to line up fore and aft and to be located at level of top of pitch.

Bilge: Bottom of boat to top of keel batten to be filled with pitch to form surface for bilge water and prevent water lying on the planking near the garboard seam. One bay to be left clean of pitch to form a pump well.

Frames: To be the straight-grained young white oak sided and molded 1¾ inches, steam-bent and spaced to 10 inches on center. Frames in way of engine bed, *i. e.*, frames Nos. 21 to 27 inclusive, to be 1¼ inches x 1½ inches. Frames Nos. 1 to 4 inclusive, to be spaced 10 inches at keel but heads of frames to be allowed to spring forward to position shown in order to avoid beveling of these frames. Each frame to be in one piece from keel to sheer. Each frame to be secured to keel batten by two galvanized boat nails.

Planking: To be of white cedar, or equal, to finish ⅞ inch thick, laid in narrow strakes averaging 4 inches and in as long lengths as possible; butts to be well distributed. No strake to have more than two butts and all butts to be made by butting adjoining ends of plank together and fastening ends to 1¼-inch oak butt block fitted tightly between the frames slightly more than the width of the plank. Garboard strake and strake at lower sheer to be of white oak or yellow pine and garboard strake at keel and

ends of all planking strakes at stem, transom and tunnel to be fastened by long brass screws. Each plank to be fastened to each frame by two copper-wire rivets over burrs, heads countersunk and plugged. Planking in tunnel to be painted with white lead, caulked with yacht cotton and finished, flush with putty or seam composition. Seams around shaft-log and strut where they extend through planking to be caulked.

Strut: To be of white oak sided 5½ inches at shaft and 3 inches at ends. To be well fastened at ends to tunnel arch and keel, and tapered as much as possible to reduce resistance. To be fitted with lignum-vitæ bearing of proper size.

Tunnel Construction: Tunnel arch extending fore and aft from shaft-log to transom to be of white oak sided 6 inches. molded 2 inches, steam-bent to form shown and reinforced by 4-inch piece connected to shaft-log. Side framing pieces to be 2¼ x 2¼ inches beveled to suit angle of plank, extending from shaft-log, to which framing piece is to be secured by oak knee, to transom to which framing pieces are to be secured by oak knee extending onto tunnel framing piece and up onto transom framing piece. Tunnel side framing pieces to be secured to floor timbers by galvanized rods riveted. Tunnel planking to be same as hull planking. Sides of tunnel to be closed in by 1-inch white cedar board cut to shape, brass-screw fastened. Tunnel seams to be treated same as hull planking seams.

Sheer Clamp: To be of yellow pine, fir, or spruce 1⅛ x 5 inches, tapered slightly at ends. To be fastened at each frame by heavy galvanized wire nail riveted over ring and by one galvanized boat nail. Clamp to be chamfered on inner edges for finish. To be secured to stem by 1¼-inch oak breast hook secured by galvanized rods riveted.

Raised Deck Clamp and Bilge Stringers: To be of yellow pine, fir or spruce, 1 x 2½ inches secured same as lower sheer clamp.

Sheer Ribband: At lower sheer a white oak 2-inch half-round shall be secured by long galvanized screws, heads countersunk and plugged. Screws to be at least 3½ inches long.

Rubbing Ribband Aft on Side: Extending forward from the transom a white oak ribband of 1½-inch half-round shall be fastened by 3-inch galvanized screws.

Transom: An oak framing all around edge and across top of 1½ x 2-inch pieces shall be provided. Similar pieces shall be fitted on center line and to take knee at tunnel framing piece each side. Transom to be constructed of two thicknesses of ¼-inch white cedar, seams of outer layer to come in middle of inner strakes. Whole to be fastened together by brass screws, heads countersunk and plugged. Outer layer to be laid on thick coating of white lead. Transom to be joinered smooth, seams payed with white lead, caulked with yacht cotton and filled flush with white lead, putty or seam composition. To be finished white same as topsides. Half-round oak or mahogany to be secured across top of transom.

Raised Deck Beams: To be of white oak 1⅛ x 2 inches, spaced and crowned as per plan. Beams at forward end of companionway and at each end of skylight and hatch to be 1½ x 2 inches. Beams to be notched over clamp and secured to same at ends. Lower edges to be chamfered.

Raised Deck Planking: To be ¾ x 2½ inches tongued, grooved and V-d cypress or pine fastened with galvanized nails, heads punched beneath surface, joinered smooth and covered with 10-ounce canvas laid in thick white lead paint while paint is wet, so as to saturate the canvas, edges of canvas turned up at skylights, hatches and companionway and fastened and covered by finish pieces or quarter-rounds. Canvas at raised sheer covered by 1½-inch half-round.

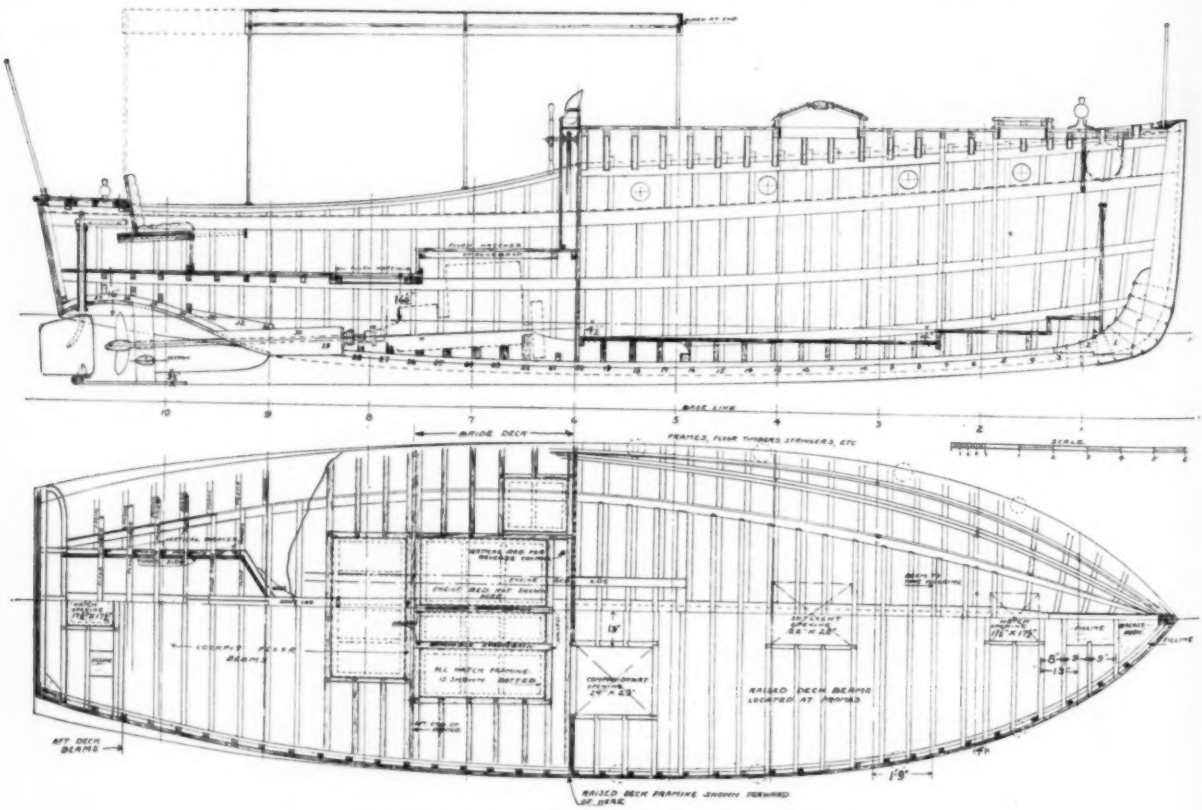
Bulkheads: Cabin bulkhead at forward end of cockpit to be ⅞ x 2½-inch oak, cypress or mahogany, tongued, grooved and V-d. Interior bulkheads and partitions to be ½ x 2½ in.

Cockpit Floor Beams and Planking: To be of white oak, 1⅛ x 2 inches, spaces as per plan. To have no crown, but care is to be taken that center of floor does not sag and form a hollow spot. Flush hatch to be framed out in 1⅛ x 2-inch oak. Cockpit floor to be ¾ x 2-inch tongued, grooved white pine or equal. Floor to be painted.

Bridge Deck: Framing and beams to be same as cockpit floor except strongbacks between hatches to be 2 x 2 inches halved into 2 x 2-inch beams at ends.

Hatches: All flush hatches in cockpit and on aft deck to be bound with 1 1/16 x 1½-inch hard brass strip screw fast-

(*Continued on page 78*)



Construction details for the tunnel-stern cruiser Dolphin

Some Waterfront Logic Applied to Lubrication

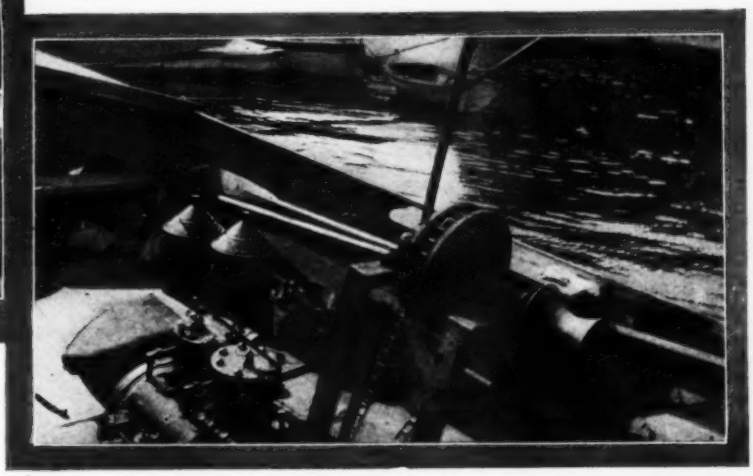
Methods Employed by the Veteran Lobsterman in Boston Harbor Insure Freedom from Seized Bearings and Troubles of a Like Nature

By George Story Hudson

PHILOSOPHY, in big and little doses as applied to marine motors, as well as to the gadgets hitched to them, is rampant along the waterfront of every port where fishermen, bum-boatmen, ship runners, junkies, linesmen and the like ply their trade. Each of these individuals who depends on the motor for a living boosts his pet idea about operating the two-cycle, the four-cycle, as well as the different makes of hoisters with which their craft are frequently equipped. I'd like to get these men together in a forum on gas engine operation and I wager they would drop some startling and instructive dope provided the session didn't come to blows, which would be likely, for the average waterman will not stand being contradicted on theory or practice.

There's Capt. Jim Adams, for illustration, erstwhile king of Snake Island, Boston Harbor. Capt. Adams is dean of all the lobstermen and strong on lubricants and prides himself as having bought the first Mianus motor ever sold by Ed. Gray, of the Gray-Aldrich Co., that city. The Cap'n declares he would be running that motor now if he had known the secret of plenty of oil, a pinch of graphite and generous greasing. He has had his present 5 h. p. seven years in a 20-foot dory tending traps at cost of a few cents for a spring that jumped overside like a joyous flea from the make-and-break mechanism.

Capt. Jim Adams of Boston, Dean of all the lobstermen



Simple hoisting gear, popular with lobstermen, driven by chain from shaft

For forty years Capt. Adams has been catching lobsters in Boston waters and would have quit long ago had not the motor proved such a real help underrunning a mile-long string on such small consumption of fuel that he replenishes the tank "when he happens to think of it." But it's the lubrication of the motor that sets him going in glowing terms as if he had a panacea for ills to which boatmen are heir. There's always a can of oil in back of the Adams motor and handy to reach. It's a good brand of oil, too, for this lobsterman is quite particular to provide himself with the best lubricant on the market.

Of course, we cannot subscribe to every brand of waterfront philosophy, whether it be oil or the most suitable material for spark points, yet Capt. Adams, in a way, appears to be on the right track provided he does not ride his hobby too far. In any event, he comes and goes without encountering motor difficulty that necessitates a visit to a repair plant, and that is saying a good deal considering the sort of fuel we're up against. Two sets of six dry cells furnish ignition for twelve months in this lobsterman's boat, and he ties them in a bunch, shoves the source of current on a shelf and forgets all about ignition till the motor begins to skip—warning to set up on the binders that may have worked loose through vibration—and application of the pliers usually is all there is to it. He has his sight feed in addition to the "pint to five gallons" in the fuel tank because he wishes to be sure that the crankpin is getting enough, the six-drops-to-the-minute going to the right spot. Occasionally he mixes a pinch of graphite with the oil for the cup because of the glassy surface built up by that method.

"Give her plenty of oil and you can't go far wrong," advises the veteran lobsterman, who goes on theory that a motor is mainly metal rubbing together unless a film of oil is interposed between surfaces. He points out that friction destroys machinery and careless operation of one's motor starts it quickly along the road to a junk pile, with all the disquieting symptoms that precede dissolution.

I observed that there was considerable play to the Cap'n's motor bearings, a circumstance that might make it a bit difficult to keep lubricant where it would do the most good—and said as much to this exponent of the viscous substance. Evidently he was expecting something of the sort, for he came back promptly:

"I let her run loose purposely in order to hear what she's thinking about while at work," he explained. "When a motor has clearance, it is bound to get oil and never can freeze or burn out a bearing. Of course, I take her up enough to prevent slapping and knocking, otherwise I judge her to be in regular health for easy running, and I guess I am getting all the horsepower I paid for with this open exhaust line that does away with back pressure. Give me a slack motor every time for good honest work," he went on, "but I want to be the judge how much she's slack myself, so's to prescribe the proper oil—heavy, medium or light, and the body of the grease for the main bearings to hold base compression. Naturally she spatters more or less, but a motor that does not spatter is not getting lubricated rightly, to my thinking."

That's one brand of waterfront philosophy from Boston and, after all, it embodies a good deal of horse sense, I'll say.

Diesel Engines for Commercial Boats

The Selection of a Power Plant Simplified So That the Commercial Boat Owner May Determine the Most Economical Size and Type of Unit

By G. C. Davison
Vice-President, New London Ship & Engine Co.

THE owner of a commercial motor boat is always interested in the forms of power available for its propulsion. He must have a plant that is not only reliable in operation, but one which is safe, requires a minimum of attendance and is subject to a minimum cost of operation. at the present time the internal-combustion engine is so far developed that no boat owner thinks of installing anything else in any boat which requires less than several hundred horsepower. In the larger sizes of boat requiring powers of say 300 horsepower and over the choice is between steam and internal-combustion engines. Even in this field the steam engine is rapidly being replaced by the internal-combustion engine, so that it can be said that in the commercial motor boat field the boat owner must choose between the various types of internal-combustion engine.

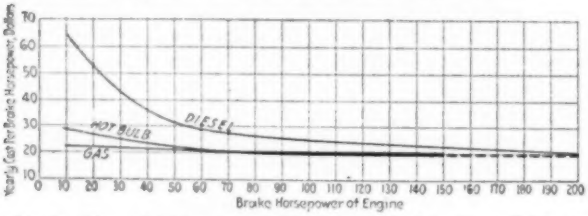


Fig. 1—Chart showing the comparative operating costs of Diesel, hot-bulb and gas engines based upon 250-hr. yearly operation

There are, broadly speaking, three forms of internal-combustion engines available today in small and moderate sizes. There is (*a*) the gas engine, (*b*) the surface-ignition or hot-bulb engine, and (*c*) the Diesel engine. There are several variants of these three types, but for the purposes of this discussion only the three general types will be considered. Charts have been prepared which show certain approximate costs of operation of the three types for various sizes of engine. Before discussing these charts in detail, the basis of plotting will be given.

Fig. 1 is a chart representing 250 hours of operation per annum, which is about the average for a yacht, Fig. 2 represents 1,500 hours of operation per annum, which is about the average for a work boat in a seasonal trade, and Fig. 3 is for 3,000 hours of operation per annum, which covers approximately the case of the boat which is used the year round.

These charts cover the fixed charges plus the fuel cost of

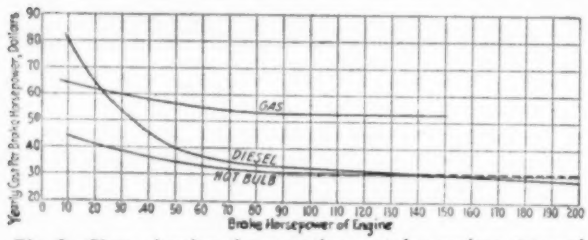


Fig. 2—Chart showing the operating cost for various types of internal-combustion engines based on an annual operating time of 1,500 hrs.

operation. In establishing the fixed charges it is first necessary, of course, to estimate the cost of installation. This is variable, depending upon circumstances, but as a fair minimum the first cost has been assumed as the cost of the engine plus 15 per cent. This 15 per cent represents the cost of installing the engine in the boat complete with all piping, shafting, propellers and such auxiliaries as are necessary for the operation of the ship. In case the machinery is to be installed in an old boat, this item will be greatly increased, but the relative proportions will scarcely be changed. The first cost of the engines only has been estimated as follows:

First Cost of Various Engines

Type and Size of Engine	Cost per b.h.p.
25 h.p. Diesel	$200
25 h.p. Hot Bulb	100
25 h.p. Gas	60
50 h.p. Diesel	125
50 h.p. Hot Bulb	85
50 h.p. Gas	60
100 h.p. and larger Diesel	100
100 h.p. Hot Bulb	75
100 h.p. Gas	60

In considering these costs, it must be remembered that these remarks apply only to heavy-duty engines suitable for work boats. If light-weight high-speed engines are concerned the proportions will be entirely changed. The total fixed charges for each year have been taken at 20 per cent in each case. This 20 per cent consists of 11 per cent for depreciation, 6 per cent for interest on the investment and 3 per cent for repairs. The depreciation item is perhaps rather severe on the Diesel engine, but for the purposes of this comparison it was thought better to assume the same percentage in all cases. For the 100 h.p. sizes the fuel consumption has been taken as 6½ gal. per hr. for the Diesel, 9 gal. per hr. for the hot-bulb engine and 10 gal. per hr. for

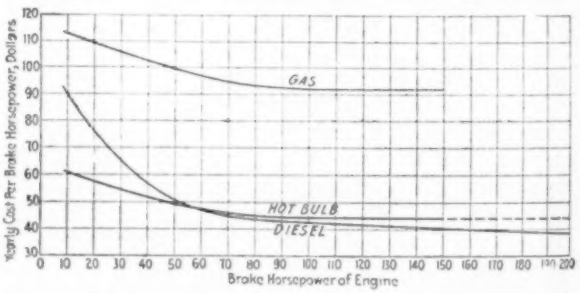


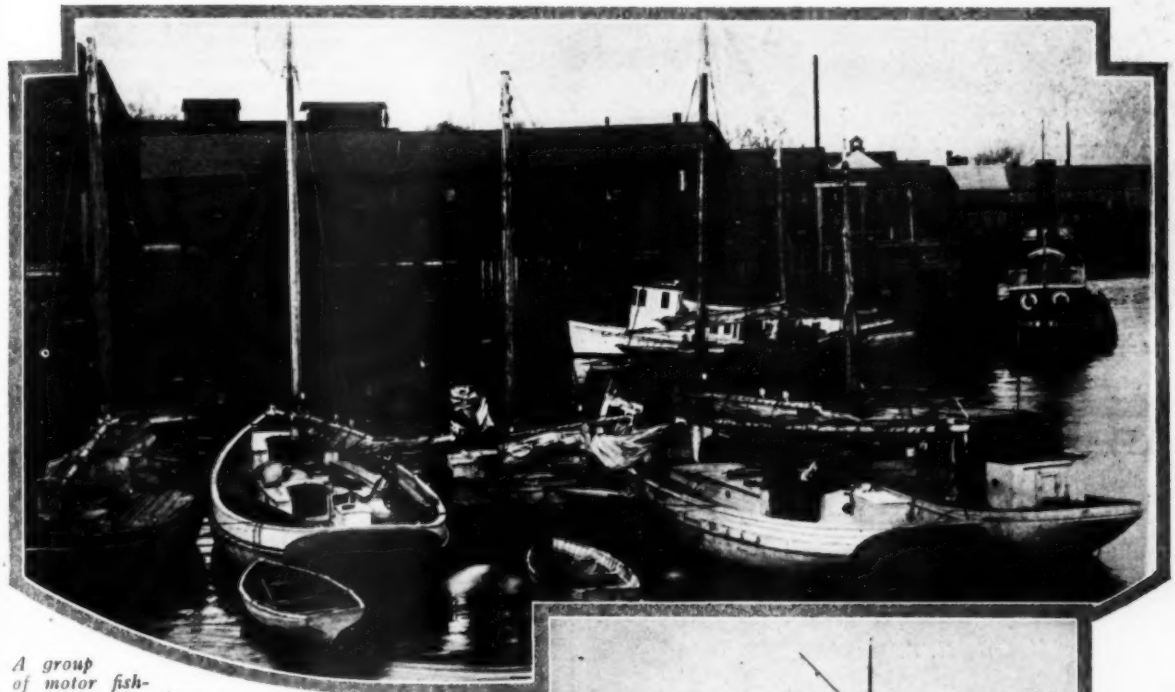
Fig. 3—Operating cost of an engine in a vessel which is in service for 3,000 hrs. annually or practically the entire year

the gas engine. The fuel consumption has been increased somewhat for the smaller sizes and decreased slightly for the larger sizes. It varies with the mechanical condition of the engines and the care of the operator much more in the case of the gas engine than in the hot-bulb, and the hot-bulb is more sensitive than the Diesel, but these consumptions have been taken as representing good average conditions with care upon the part of the operator. A poorer consumption on the part of the other engines will only make the case more favorable for the Diesel engine. The prices of fuel have been assumed as 10 cents per gal. for the Diesel and hot-bulb engines, and 26 cents per gal. for gasoline for the gas engine. These are less than the present-day retail prices along this section of the Atlantic coast, but the price ratio will remain about the same in any case and the shape and relative positions of the curves will not be changed.

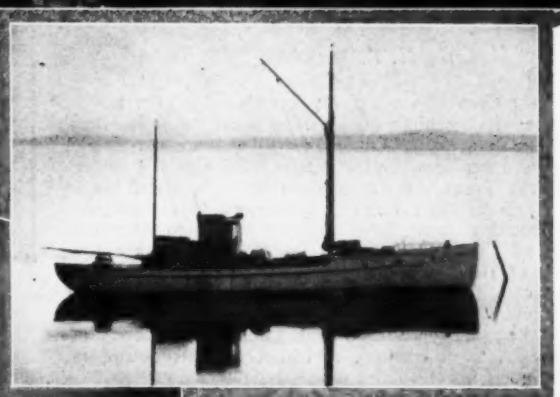
An inspection of these charts will show at a glance that the gas engine is out of the running entirely except in the case of the yacht; that is to say, in spite of its low first cost, the high cost of fuel brings up the cost of operation so that within the limits of sizes under discussion it is almost never economical to install a gas engine. The boat owner simply cannot afford to install a gas engine in any size where the oil engine is available.

(*Continued on page 108*)

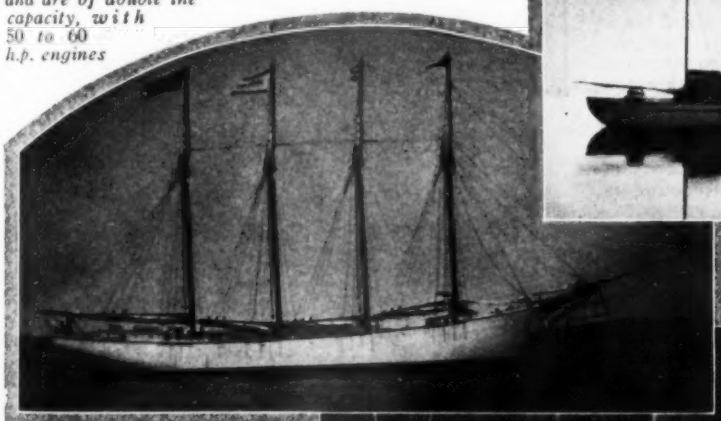
Workers—All



A group of motor fishing craft costing from $4,000 to $6,000, equipped with 30 to 35 h.p. engines. The newer boats of this type cost from $10,000 to $15,000 and are of double the capacity, with 50 to 60 h.p. engines



This work boat was formerly a pleasure yacht of 23 tons. She has a 25-h.p. Standard engine



Four-masted auxiliary schooner David Cohen, valued at $150,000. She is 192 feet overall, 37 feet beam, 15-foot draft and of 800 tons. Has two 100 h.p. crude oil-burning engines, with a speed of 6 knots. Has two 5,000-gallon fuel tanks, another of 1,200 gallons for kerosene and one of 600 gallons for lubricating oil. There is also a 4 h.p. air-compressing electric plant and a 16 h.p. Mianus motor for hoisting sails and anchors

Right: Here is an auxiliary with only a 5-h.p. Regal engine that travelled over 25,000 miles on one trip. Sir Francis Drake made the trip from Seattle, Washington, to Eastport, Maine, in about 60 days

Albertha, atop of a lock

An Ideal Cruise for the Inland Salt

The Great Possibilities Offered by the New Trent Canal Which Connects Lake Ontario with Georgian Bay

By M. E. Mutchler

LEAVE the deep water cruising for the salty, for mine, a little of the rough goes a long way. And you get that much crossing Lake Ontario about the first of September and heading for the Murray Canal. The latter opens into the Trent, a series of canalized rivers and lakes which lead up through Lake Somcoe and into Georgian Bay. It would require three to four weeks to complete the travel of these waterways. To those who have the time—go. To those who have but a week or two, go as far as you can. But in your vacation cruising, don't overlook the Trent Canal. The farthest the writer has cruised is to Mud Lake (round trip about 450 miles) where the fishing is fair, as illustrated, and where the shooting is good, if you go a little later when the ducks fly.

Every cruise ought to be planned ahead. A commissary department is most important and if everyone puts fifty bucks in the kitty and elects a financial department right at the start, you avoid friction and it's easy to settle up at the end of the trip. A Boat Department, to locate a suitable boat, which in this case was a forty-two footer, capable of nine miles an hour and with sleeping accommodations for twelve, and a Transportation Committee, to loan their cars for the swift conveyance of the bunch to and from the boat, are both most necessary. Also, it furnishes diversion; as in the case of Pop Weinheimer's big Packard, which was loaded to the gun'ls, yet managed to out-amble a chicken or two that couldn't accelerate above 66, which the Packard could.

There was Drullard, who officiated as commissary department, treasury and half cook. (No sarcasm intended.) The author also cooked, having previously served in the Boat Department, and we two ate pretty well. Dad Mayer brought aboard fragrancy (hereinafter mentioned), also served as boat pusher, a self-imposed title, and officiated when locking through. He, with Dad Weinheimer, Pop Webber and Smith, all of whom served in a like capacity, and the skipper, were really more efficient at poker and worked mostly at that. Seemingly they became slightly mixed on the two occupations and pushed most of their rolls to Weinheimer, who thereupon cleaned up expenses. Clarence, who made eighteen small plunks and dropped nine of them, and Karl, who parted with a quarter of a century early in the game, thereupon officiated alternately at K. P., while toothless Allie worked hard consuming the major portion of twenty-three cans of beans and several two-quart cans of strawberry jam, with a siding of sardines and a bottle of ale on retiring. The most important member, by weight and occupation, was Ken, 270 pounds of engineer, crew and good nature. These comprised the gang which was mixed as to ages and temperaments and therefore congenial.

The run across from Lake Ontario from Olcott, N. Y., down the Canadian side was rough enough to cause the old boys, as Allie named them, to

The Cap' and Commodore Headley of the Olcott Beach Yacht Club

hunt the cabin, also a choice bottle or two of Webber's, which, mixed by that redoubtable barkeep, would have left Rip Van Winkle sleeping yet, and then the inevitable poker game.

The most eventful occurrence was the appearance, when we docked at Port Colborne for the night, of Pop Webber,

clad in a brilliant pair of pink pajamas and perfumed like the Sultan of Bulganavia. It grated so keenly on Smith's fine sensibilities that he felt it incumbent upon him to wave Dad Mayer's package of fragrancy violently about the cabin before retiring. Between the two odors, four of us decided to sleep on deck. Allie slept on 2½ chairs and got up in the morning bent where he hadn't any joints. The two cooks were well provided with cushions and their comforts were solicitously inquired after by the crew who, lacking in the culinary art, still desired to eat.

And well it was so, for in the sweet morning hours while the crew slept on the bridge, Ken navigated with one hand on the wheel, feet in the middle of Karl's and Clarence's backs while the writer hooked himself on a projection in the galley and rustled hot coffee and bacon and eggs for eleven on that cold frosty morning. Albertha was headed quartering stern to a six-foot roll which pitched her diagonally every two flickers of the galley stove. When breakfast was half over, the celebrated barkeep had to have Postum instead of coffee and the cook made a silent resolve to square with friend Webber.

During the morning a terrific and overpowering odor began emanating from the region of the galley. It was debated whether we were being gassed or boarded by Chinese pirates. A careful count disclosed the absence of Dad Mayer and he was caught folding heavy tinfoil about the package that Smith scented the cabin with the night before. Sweet essence of burned overshoes! Three pounds of fragrant, ripe, odoriferous limburger!

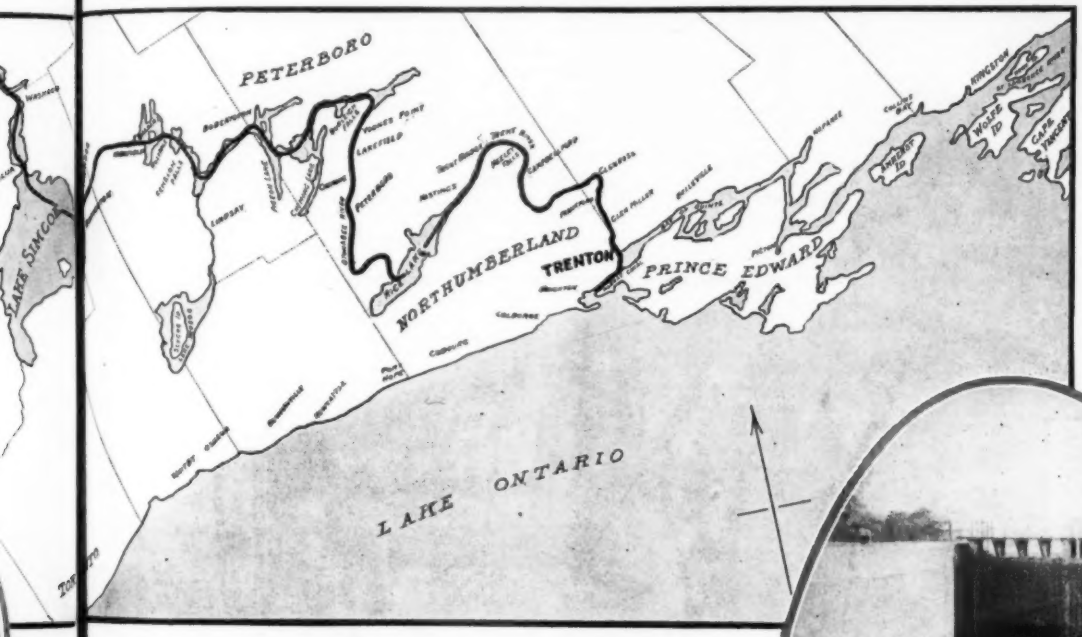
Among the chief events of this Trent cruise were not only the frequent appearances of the limburger but the enchanting, exotic, sublimely captivating mixture of Orange Blossom, beats a Manhattan, rightly down to the tune of the Love Nest, with the engine purring us up a winding river flanked by the finest pastoral scenery in any navigable waters. The scenery improved with the barkeep's skill.

The numerous locks are interesting in that they relieve the monotony, but the big hydraulic lift lock above Peterboro should be classified as an eighth wonder. Sixty-five feet up in the air like an elevator, the boat in a trough of water, sealed at both ends, and you float atop a hillside from which a verdant valley is visible for miles, divided by the winding stream just traversed.

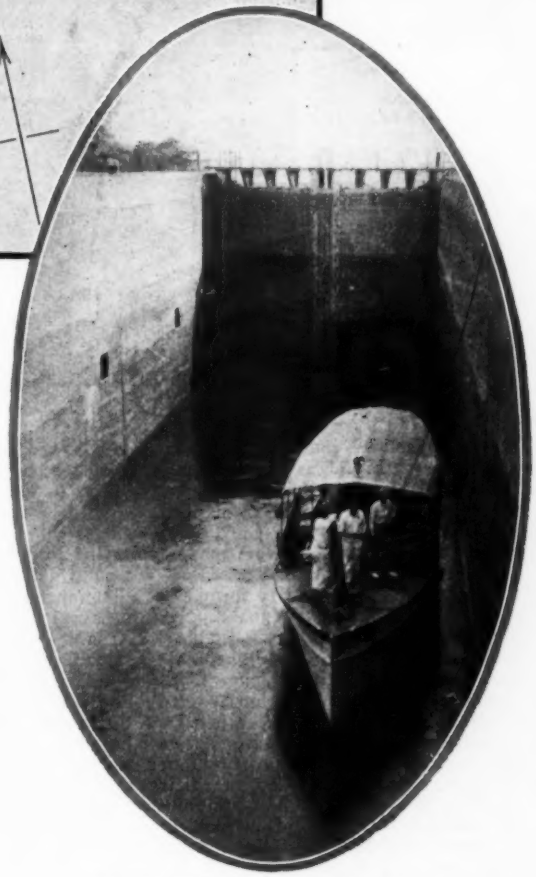
The hootch flowed freely, but judiciously, for the limit was the bottom of each brown bottle and what's a bottle a day to eleven? If there was one thing in which Webber was efficient, it was in uncorking the bottles and passing the larynx lubricant. Yet at meal time he always kidded his appetite with the unforgetable Postum.

Came a time, however. Came a time when all those burned thumbs and fingers, too often dipped in the scalding water in juggling the cup over the fire in a rolling sea, got square. When the Transportation Committee officiated the second time, Pop Webber wisely strolled back of his car before starting and discovered his favorite pink pajamas tied to the gasoline tank. Wisely he mounted his iron steed and drove wisely away, serenely in ignorance of the remains of the three pounds of limburger which reposed in his suit case, among his apparel, and which had been setting for several hours in a hot morning sun.

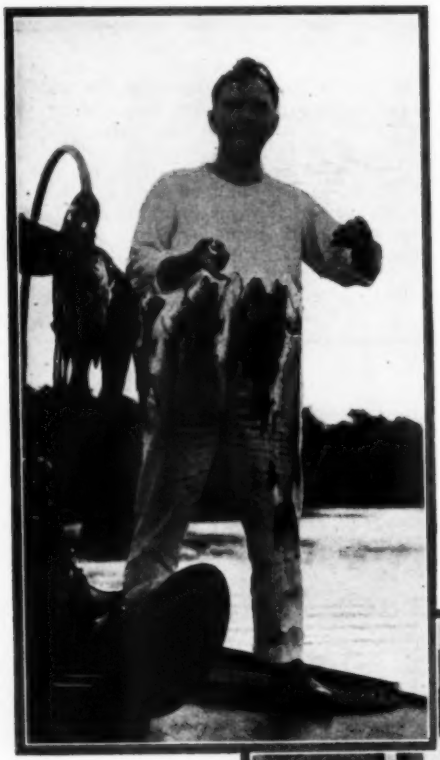
At Mud Lake there is a Chippewa Indian village where you can buy birch bark and porcupine containers for hairpins, etc., from divers Chippewains all named Taylor. Dow Taylor will collect a good group of guides, at $4.50 per



The Trent Canal which connects Lake Ontario with Georgian Bay



The Trent Canal is noted for its large locks. This is one of them



The author and the dinner.—He doesn't say who caught the dinner

The lock at Peterboro, 65 feet up

by the stake, thirty feet to the good. Dow Taylor scarcely moved. Lying on the wheel, he paid no heed to protestations or questions and simply, with eyes fixed ahead, peered into the solid dark. The wind whistled, once in a while Albertha buried her nose and flying spray drenched the bridge. Dow spat overboard, perhaps he had never handled a cruiser or a motor boat before, but he knew that lake and channel and when finally the lights of Buckhorn glimmered ahead, we were within a hundred yards of the lock before we sighted it. It was one wild ride.

Oh yes! And there was the Y. W. C. A. Camp below Buckhorn. Blond mermaids, brunette Loreleis, sirens of enchanting attraction, draped the rocks and waved an inviting bidding as we passed. Even the old boys risked an eye, and turned and risked the other.

But you should cruise the Trent, gather your own enjoyment, make your fun as you go, and returning, have memories that linger far in the future.

You will find Canadians hospitable and glad to see you. They will go out of their way to direct you, willingly furnish bait, live minnows and frogs and show you where to find the best fishing.

The Trent was originally engineered as a political proposition, held up as a source of hydro-power, and a means of economical transportation. Failing in that, by comparison to the promises made for it, it is an entry to a farm land of plenty, rolling hillsides, sleek cattle, fishing and hunting and September is the month to go.

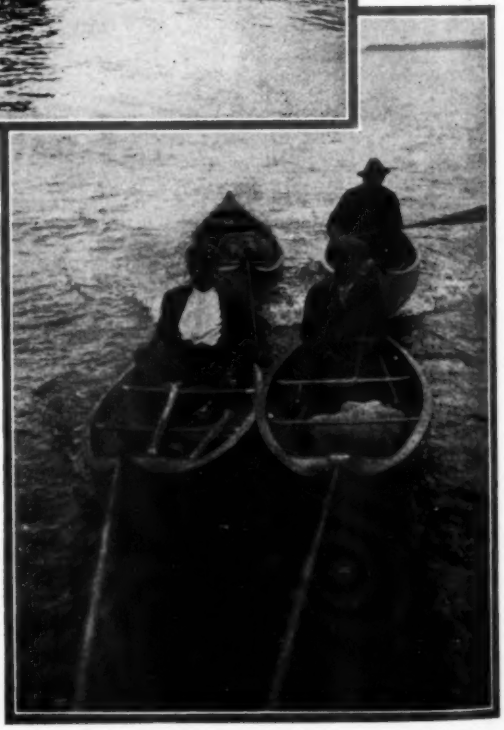
A trip of this kind can be made for a nominal amount. By chartering a comfortable cruiser and having the members of the crew do the cooking, a nine or ten day trip actually cost the nine who assumed the

(*Continued on page* 54)

day, with canoes. and they will see that you get at least one large, fat bass and as many more as your patience and skill permit.

On the day we passed through we hired five guides and it was the author's day to cook. Five guides and our original eleven hungry cook annoyers made a total of thirty-seven good appetites to be fed at dinner. How that gang did eat! During the late morning five-party members each financed a guide and paddled off in search of bass. Six of us stayed aboard Albertha. At noon they all assembled on board and each had a large fat fish or two. Weinheimer, who had remained aboard, had bought a large muskalonge from an Indian for $1.00. The Indian had the fish in a burlap bag. Pop put the muskalonge in the water pail with the other fish. Of course, Pop having supposedly caught the largest fish was the envy of those not in on the know. After a hearty dinner, flooded with three cups of coffee each, the guides and charges started out again, but thinking to catch the mate to the musky, lingered near Albertha, all except Dow Taylor. Dow walked over to Pop and said, "You no ketch him. Him have lint on him." He had noticed the lint from the burlap bag.

That night, with Buckhorn twenty miles away, around rocky ledges, through swamp channels, and in the inky blackness, Dow guided Albertha to the lock. The wind whipped up a nasty chop on the little lake, there wasn't a thing to be seen; the searchlight played ahead for channel stakes, and was lost in the impenetrable darkness. Yet each time the skipper became nervous and threw the light abeam, he would invariably locate us flying

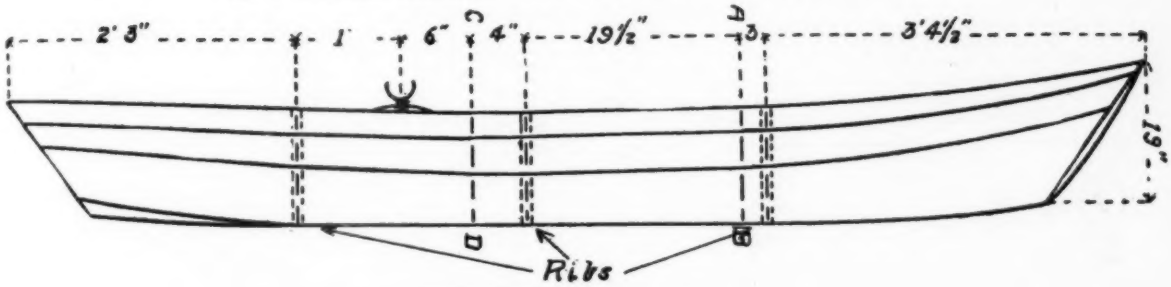


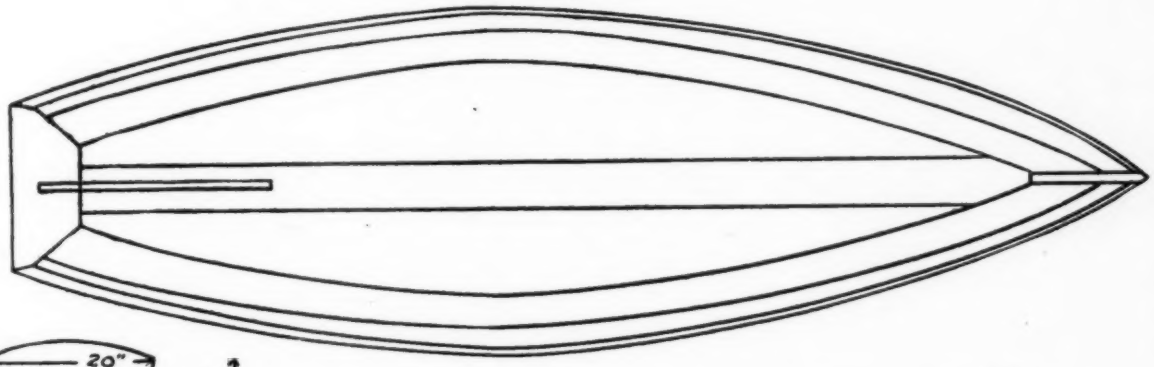
Towing the Chippewa Indian guides at Mud Lake

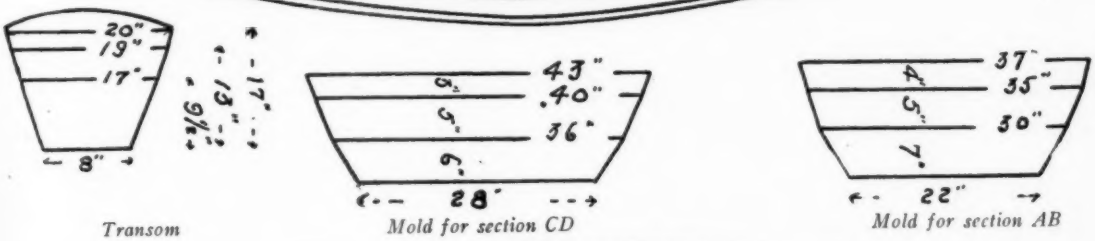
Build a Boat

Two Simple Dinghies Which Can Easily Be Built At Home

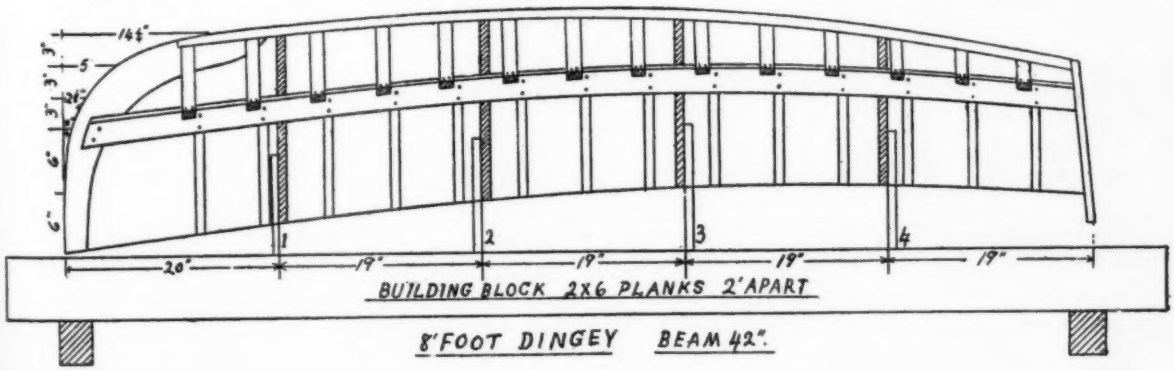
No. 4—MoToR BoatinG's HOME BUILDERS' DEPARTMENT



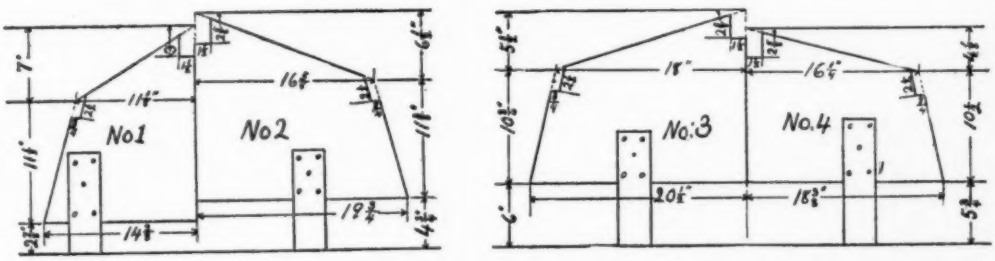




Transom *Mold for section CD* *Mold for section AB*



8' FOOT DINGEY BEAM 42".



Plans of a 9-foot dory type dinghy and an 8-foot V-bottom tender

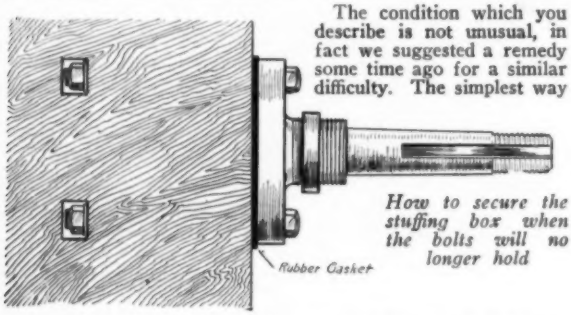
The Way We Would Do It

Conducted by F. W. Horenburger and A. E. Snyder

EVERY month MoToR BoatinG's staff of experts answers thousands of inquiries about boats, engines, accessories and, in fact, everything marine. There is hardly a branch of the sport or industry on which they are not constantly being asked to give their opinions. They are very glad to do this, as well as to be of whatever service they can to MoToR BoatinG's subscribers and readers.

Quite naturally, many requests for information are received on subjects which are not of universal interest to every motor boatman. This, as well as the fact that it would be a physical impossibility to print answers to all questions received, makes it necessary for us to follow the rule of only printing answers to the few most important and interesting questions. However, we always give a reply by mail, so if you are perplexed about any questions pertaining to boating, don't hesitate to write to "The Way We Would Do It" Editor.

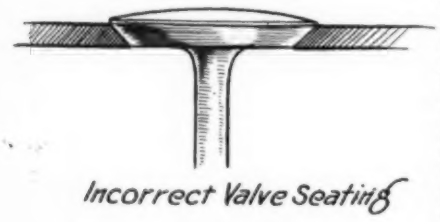
ON inspecting my boat I found that the bolt holes at the stuffing box were enlarged to such an extent that the bolts were no longer effective. Owing to the narrow deadwood there is no way in which I can turn the box around so as to get the holes in a new place. Can you tell me how I can secure the stuffing box under the circumstances? H.C.P., Galveston, Texas.



How to secure the stuffing box when the bolts will no longer hold

The condition which you describe is not unusual, in fact we suggested a remedy some time ago for a similar difficulty. The simplest way to attach the stuffing box would be to cut a square hole through the shaft log intersecting the bolt hole. A bronze bolt of suitable length can then be turned through the stuffing box and shaft log into a bronze nut which is let into the hole previously cut. It would be well to pack the bolt hole with white lead before the bolt goes through and also apply a sheet rubber packing gasket between the wood and the stuffing box to insure water tightness. The opening over the nut can be closed after the hole is packed with white lead putty or other similar compound.

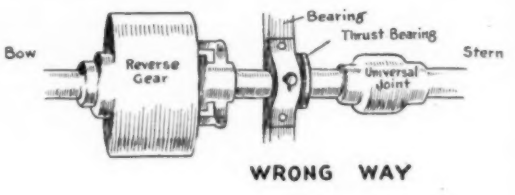
* * *



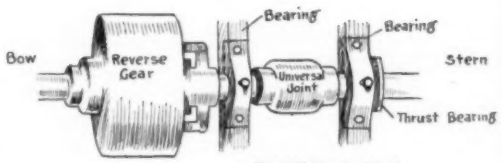
Overgrinding tends to wear the valve seat as well as the valve

As I am now getting ready to overhaul my motor for the coming season, I take the liberty of asking you how often should the valves be ground. I have noticed in some of the engines I have seen along our water front that the valves sink considerably in their seat and others seem to be quite high. If the latter one is correct as it is that way in my engine it seems to me that the former one became that way by grinding too often. Am I correct? As I am particularly anxious to learn the proper method of valve grinding and in that way not ruin my engine, which is only one season old, I patiently await your reply. M.C., New Orleans, La.

In common with many other operations there is a right and wrong way of grinding the valves on an internal combustion motor. The valves are required to be gas tight to insure the correct and efficient operation of the motor. Valves which are pitted and leaking must be overhauled promptly. Several operations are necessary. First, the roughing, finishing and testing. Roughing can be done by means of a brace and bit to turn the valve in its seat with a rather course grinding compound. As these abrasives cut very rapidly care must be taken not to grind too much. The valves should be inspected frequently and the grinding stopped when all the deep pits are removed. A further grinding can then be done with a very fine abrasive which will polish the surface and eliminate all scratches. The last operation should be to grind the valve in its seat without any abrasive whatever and simply polish the surfaces. The grinding should be done by frequently lifting the valve from its seat and rotating it back and forth instead of in the same direction. To test the valve it is seated and a little gasoline squirted on its surface. If the gasoline does not leak through the valve it can be considered to be in good condition. It will sometimes happen that valves are so badly pitted as to require resurfacing. This is done by means of special tools and is probably beyond the scope of the amateur.

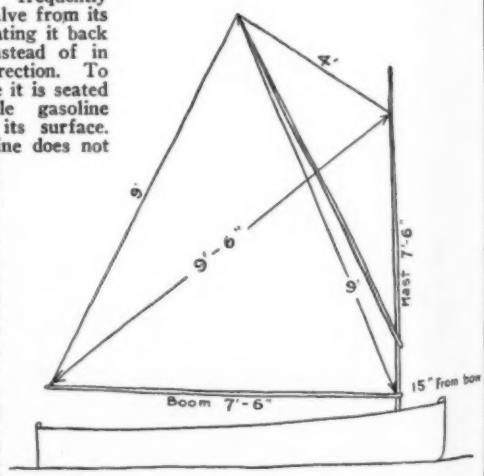


WRONG WAY



RIGHT WAY

The universal joint must always be fitted forward of the thrust bearing



A sprit sail rig for a small dinghy

* * *

In altering my boat I find it advisable to shift the location of the motor forward where it will be placed under hatches instead of in the cockpit. I do not wish to change the shaft hole through the keel and write for suggestions as (Continued on page 56)

Yard and Shop

Notes of Interest to Both Owner and Manufacturer

Gray Motor Company Reorganized

Frank L. Klingensmith, formerly Vice-President and General Manager of the Ford Motor Company, and Frank F. Beall, formerly Vice-President in charge of manufacturing of the Packard Motor Car Company, with a group of strong capitalists, including the owners of the old Gray Motor Company, have acquired control of that old established motor building concern.

The new company, with Mr. Klingensmith as president, Mr. Beall as vice-president and general manager, will continue and expand their motor building business, the factory management of which will be in charge of William A. Blackburn, formerly factory manager of the Cadillac Motor Car Company, and will continue the production of Gray motors on a very much larger scale.

The new company will produce in the early fall a $1500 motor car of the very highest possible type, including all the experience acquired by Mr. Beall and Mr. Blackburn in the building of the highest class cars for years, which car will be shipped from Detroit unassembled and distributed and assembled from assembly plants located all over the world, including ten plants located in the United States.

The foreign companies will act as distributors for the Gray line of marine and other motors.

The marine and other motor business will be produced from separately organized plant units independent of the automobile business, but under the same manufacturing and executive heads.

The Gray Motor Company is one of the oldest motor building concerns in the United States and has nearly 60,000 marine motors scattered over the world in operation.

The capital of the company is four million dollars ($4,000,000.00) and it has eighteen acres of manufacturing property and a plant in the manufacturing district of Detroit.

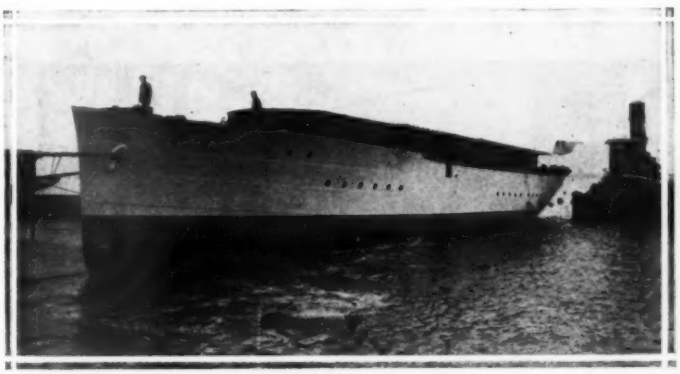
Most of the men of the old Gray Motor Company remain with the new organization and the marine policy will be continued as that of building the highest class motors at a moderate price and carry these motors in stock in large quantities for prompt shipment.

The company announces a new 40 h.p. 4-cylinder overhead valve unit plant ready for production and delivery June 1st.

Enlarged Boat Building Facilities

At Ogdensburg, New York, the Huff, Daland Company have increased their plant capacity for the production of high grade motor boats and high speed hulls. Joseph Leyaire, the proprietor of the original Leyaire Boat Works, is the designer and superintendent of the Motor Boat Department. Their facilities will permit them to quickly produce high-class motor boat hulls, as their officers and boat builders are mechanics of unusual skill. All machinery for wood and metal working is modern.

Nourmahal, the new Winton Diesel seagoing yacht, was successfully launched at Jacob's Yard, City Island, not long ago. She was designed by Cox & Stevens for Vincent Astor and will go into commission this summer. Her twin Winton Diesel motors are expected to develop 350 h.p. each at 250 r.p.m. Seaworthiness is an essential feature of the boat and her graceful lines will assure this. In construction steamship practice has been followed and the hull is noticeably heavier than the ordinary yacht of this size



Rebuilt Engines

For many motor boatmen who are unable to pay the prices asked for new motors the Hamilton Marine Engine Exchange, Brooklyn, New York, are in a position to supply rebuilt motors to suit almost any pocketbook. Motors are always available for immediate shipment and prices will be found to be very moderate.

Mullins V-Bottom Models

The Mullins Body Corporation, Salem, Ohio, announce a complete new line of models for 1921. The V-bottom type has been adopted as the most efficient and these new models have been refined to a degree never before attained by any manufacturer of stock motor boats. When properly designed and constructed they will stand more hard use and service. They are safer, as there is no tipping or rolling. They draw less water than the round bottom boat. Standardized stock boats will be produced in sizes between 17 and 25 feet length equipped with motors ranging from the 12 h.p. Universal through various sizes to the 75 h.p. 6-cylinder Scripps. A new Mullins catalogue has just been issued and can be had by request from the company.

J. V. B. Motors Represented in New York

Arrangements have been completed with the Verrier Eddy Company, New York, to represent the J. V. B. Engine Company as their exclusive dealers in New York territory. A complete stock of engines will be carried at all times and prospective purchasers will be able to examine them as much as desired.

Service on Loew-Victor and Duesenberg Parts Discontinued

The Willys Corporation, Elizabeth, New Jersey, which acquired all patterns and parts pertaining to the Loew-Victor and Duesenberg Marine engines, announce that it intends to discontinue all service of parts for these engines on May 1st. A large number of Loew-Victor and Duesenberg motors are still in service and the owners of these are advised to secure such parts as they are likely to require and before the opportunity is past. A special sale of the remaining stocks is now in progress and will continue until May 1st, after which date no further orders will be executed. Many wide awake dealers are availing themselves of this opportunity by stocking these parts where they will be available for the future benefit of owners of these motors.

A. P. B. A. Rules Adopted on West Coast

In order to secure uniformity with the

racing rules established by the American Power-Boat Association, the Pacific International Yachting Association, which includes clubs of Puget Sound and British Columbia and also the Southern California Yachting Association, have adopted these rules and their races during the coming season will be conducted under them.

Hall-Scotts Get Double Tests

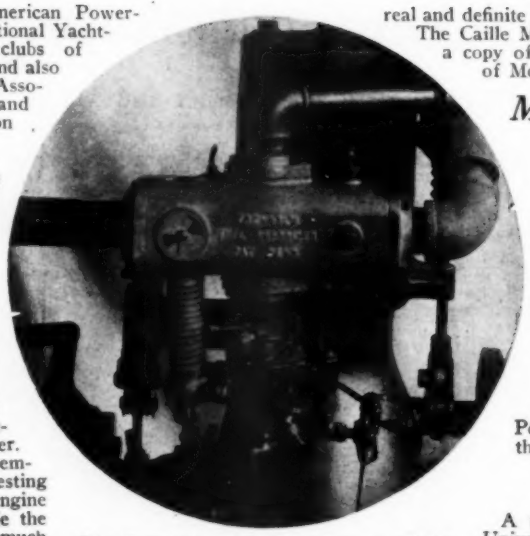
The Hall-Scott Motor Car Co., Inc., builders of Hall-Scott marine engines, are very firm believers in the very thorough testing of engines. The method of testing is extremely simple but very thorough and complete, and while rather costly, illustrates one of the principles of the Hall-Scott Company, which is that slightly higher first cost means greatly reduced upkeep cost to the purchaser. After an engine is completely assembled, it is conveyed to one of the testing stands. Here it is installed on an engine bed, resembling as nearly as possible the engine bed of a boat, but having a much greater angle, in order to thoroughly test the efficiency of the oiling system. The engine is coupled to a propeller shaft driving a calibrated propeller, which it must turn at a certain number of revolutions in order to indicate that it is delivering its full rated horsepower. The preliminary test is of from 10 to 20 hours, and is concluded with a continuous run of several hours' duration at high speed. When it receives the official O.K., the engine is removed and conveyed to the tear down and washing department. Here it is completely disassembled and all parts are thoroughly cleaned by kerosene under air pressure. The parts are then laid out for final inspection, and if satisfactory are reassembled, then the engine is taken to the testing laboratory, where final tests are made on a Sprague Electric dynamometer under the direct supervision of the engineering staff. Here complete readings are taken and full rated horse power must be delivered to the complete satisfaction of the engineer in charge. It can be readily understood, that when the engine passes through two such exhaustive tests that it is fully ready to meet the most strenuous service conditions without the usual running in and babying that so often feature the first performances of engines not so thoroughly tested.

New Marine Engine Organization

Frank B. Sexton, who is well known all over the United States, has just organized a new distributing company which will be known as the Sexton Motor Company. This new organization will operate extensively over that part of the United States east of the Mississippi River, and all territory bordering on the Gulf of Mexico, as well as look after all the exporting to the European countries for the factories whom they represent. The general offices of the new company will be located in 30 Church Street, New York, N. Y.

New Caille Catalogue

A new catalogue by the Caille Perfection Motor Company has just been issued. This book is a very attractive work and describes in complete detail all of the many models of Caille models which are being built. It contains much real and definite information for marine engine users. The Caille Motor Company will be glad to send a copy of this book to all interested readers of MoTor BoatinG.



The Trenholm Fuel Vaporizer is quickly attached to any four-cycle motor using any standard carbureter. The device will enable the motor to burn kerosene or heavier oils

RACING DATES FOR 1921

June 24	Yachtsmen's Club, Essington to Atlantic City.
July 1, 2, 4	Mississippi Valley Annual Regatta.
July 9	New York to Block Island Cruiser Race.
July 14, 15, 16	Regatta for Motor Boats at Baltimore, Md.
July 16	New York to Newburgh and return.
Aug. 4, 5, 6	Pageant of Progress Races, Chicago.
Aug. 6	A. P. B. A. Cruiser Championship of America.
Aug. 11, 12, 13	Fisher Trophy Races at Buffalo, N. Y.
Aug. 17, 18, 19	Thousand Islands Challenge Cup Races on the St. Lawrence River.
Aug. 27, 29, 30	Gold Cup, One Mile Championship and Wood-Fisher Trophy Races at Detroit.
Sept. 3, 5, 6	Races for British International Trophy, at Detroit.
Sept. 5, 6, 7	Races at Toronto.

Assembly department of the Scripps Motor Co. is busily engaged in completing many of the four and six-cylinder Scripps motors. These motors are rated from 25 to 75 h.p. on a bore and stroke of 4¼ x 6 inches

Masonic Convention in Washington

The leading Washington yacht and boat clubs are combining to make the sixteenth annual convention of the National League of Masonic Clubs at Washington, D. C., a huge success. Trips by motor boat are planned through Washington harbor to display its many attractions. The Capitol Yacht Club, Corinthian Yacht Club, Eastern Power Boat Club, Washington Yacht Club, Potomac Fishing Club and the United States Power Squadrons will all take part in the festivities.

A Baby Universal

A new addition to the family of the Universal Motor Company is the Baby Universal, which is connected to a two k.w. electric generating set, particularly suitable for yacht service. This is a direct connected, direct current generator with a four-cylinder motor, 2⅝ x 4 inches bore and stroke. This new outfit can well be said to be a masterpiece of engineering.

Five-Speed Outboard Motor

The Caille Perfection 5-speed model outboard motor with battery ignition seems to find preference with many users over the magneto equipped types. There are many advantages in battery ignition for this type of motor. These motors are designed to relieve one of the work of rowing a boat. The attachment of one of these motors to the stern of a small boat will take care of all of the hard labor of moving the boat. There are two speeds ahead, two in reverse and a neutral position. These are obtained by raising or lowering the control handle a couple of inches. This handle is also the tiller and serves to steer the boat with the motor, no rudder being required.

Dealers Report Business Booming

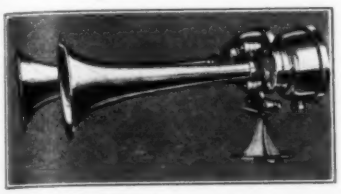
The spirit of optimism pervades the Scripps organization, not only in the home offices at Detroit, but the dealers in the field as well, that the resumption in business is not local, but is extending generally throughout the country. Reports are coming in continuously from Scripps dealers mentioning the continued sales in all parts of the country. W. L. Masters in Chicago have sold a new model D-2 which is to be installed in the cruiser being constructed by Rockland Anchor Company, Camden, Me. Walter Moreton of Boston has supplied Model D-4 to J. L. Brown of North Haven, Me. W. C. Disbrow, New York, has supplied several D-4 high-speed motors to be used in a pair of Hand 25-foot V-bottom runabouts. Other dealers, too numerous to mention, all send in similar reports and it is very evident that the

reputation of the Scripps motors is verified by these sales.

Radium

One of the most mysterious elements which have been harnessed to serve the manifold interests of mankind is radium. It is continuously being put to new and important uses by scientists. Its process of manufacture is very complex. With every 500 tons of radium-bearing ore that is mined, almost 1,000 tons of chemicals are combined and refined. From this tremendous mass, a mere twenty-eighth of an ounce is extracted. Quantity production cannot be boasted of in this industry. An entire year's work of a tremendous plant and the labor of many men produces a volume of radium which can be held in a small vial that will fit in a man's vest pocket. A derivative of radium called Luma is gradually becoming a necessity in our modern life. This compound contains genuine radium and is used on the dials of instruments and navigational equipment for ships and yachts. The peculiar property of Luma is its ability to glow in the dark. This property will persist for years without requiring exposure to light. Compass dials, clocks, gasoline gauges, light switches and any other articles which are required to be located readily in the dark can be treated with Luma and will glow for years by virtue of the peculiar property of the radium contained.

For use on shipboard there are many places where this material should prove valuable, compass cards, meters, etc.



A double-chime horn which operates on air pressure acting against bronze diaphragms made by the American Strombos Co., Philadelphia, Pa.

An Air Warning Signal

Among the many excellent signal horns to be had to-day there is one which stands out prominently by reason of its excellence. The Vibraphone is one which not only produces a steady and almost deafening noise, but also produces the type of sound vibrations which will penetrate distance. Operating on only 25 pounds of air pressure and requiring only a very small volume of air for its satisfactory functioning, the Vibraphone will undoubtedly appeal to many yachtsmen who are not now supplied with a satisfactory signal. The manufacturers of this horn, The Keystone Grinder & Mfg. Co., Pittsburgh, Pa., guarantee the instruments against all defects.

Marine Electrical Equipment

For many years the firm of Charles Cory & Son have been specialists in the manufacture of all types and varieties of mechanical communicating equipment for use on shipboard. The recent completion and occupation of their new factory and office building at 183-187 Varick Street, New York, has enabled them to take care of a largely increased demand for their products. A specialty is the electrical lighting equipments which are used extensively by commercial vessels and are practically adopted as standard by the navies of the United States as well as many foreign countries.

Engine room telegraphs are one of the many items made by this company and they are produced in all possible sizes.

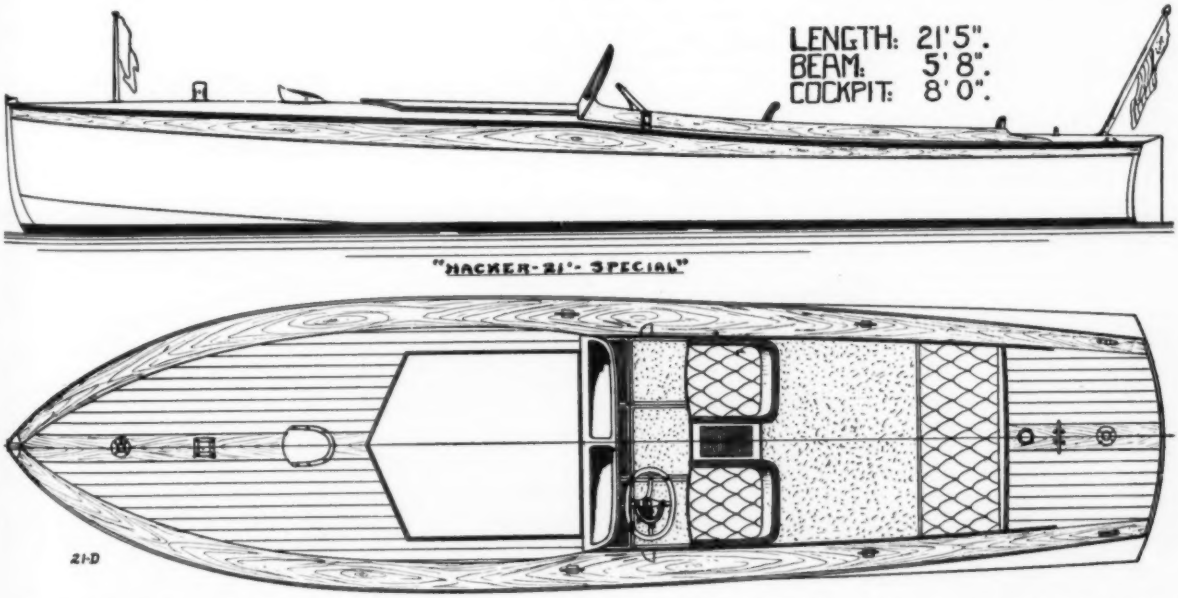
Piston Rings Save Oil

By reason of the tight joint possible in the new one-piece piston rings made by the Gill Manufacturing Company, a noticeable reduction in oil consumption is possible. The oil is prevented from entering the combustion space where it will be burned and it remains in the crank-case where it is needed. All the gas is retained on top of the piston and performs useful work instead of blowing past the rings to dilute the oil in the base.

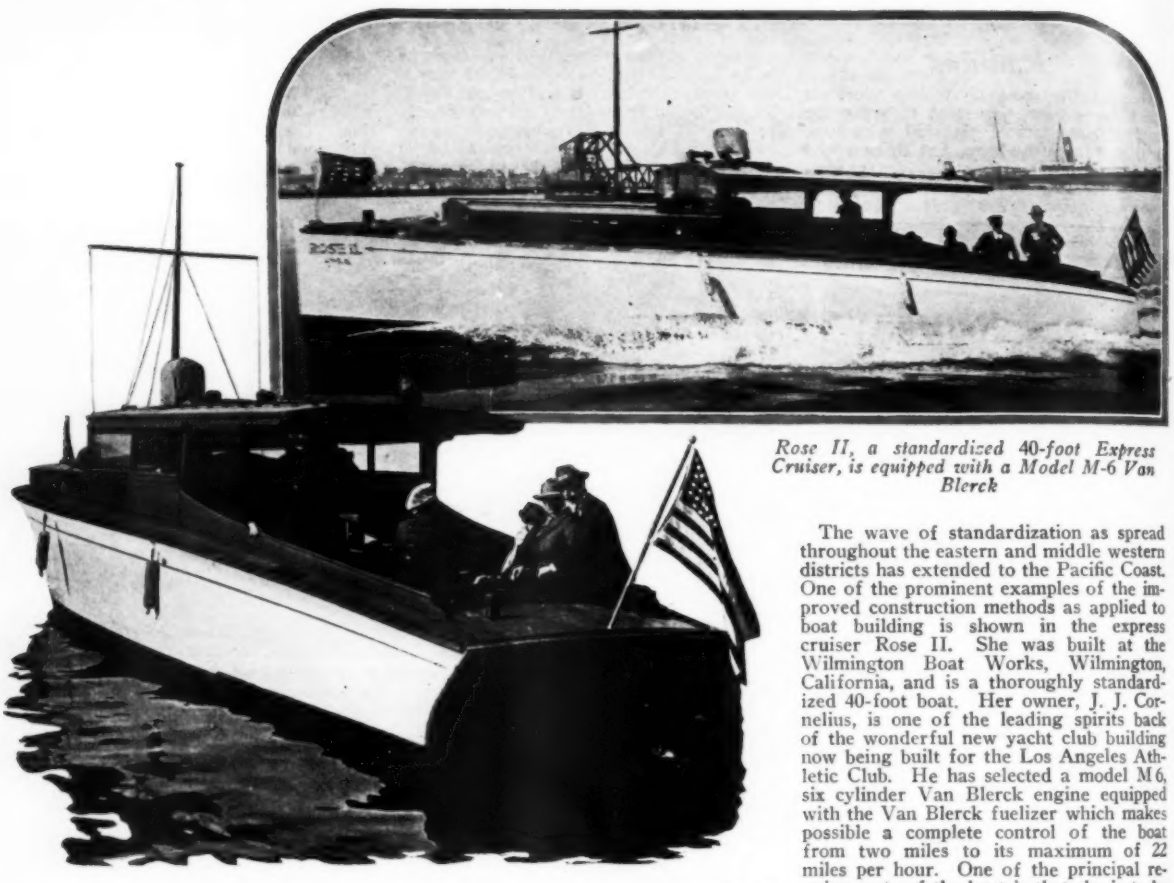
This 33-foot runabout was built by John Hafer for C. F. Colcord, of Oklahoma City, Oklahoma. A high-speed S. V. B. motor turns an 18 x 22-inch Hyde propeller with a resulting speed of 20 m.p.h.

For Cooking on the Boat

One of the annoying problems to which the cruising motor boatman is subjected is that of preparing a hot meal when away from home. The troubles with many of the present-day stoves are too well known to require mention. At last a stove has been perfected which will work at any and all times without preparation, cleaning, filling or any of the common faults. Using



The 21-foot Hacker special runabout which is to be produced in quantities by the Central Marine Service Corp. of Detroit. When powered with a 20-h.p. Kermath motor a speed of 18 m.p.h. is expected. The price is within the reach of almost anyone



Rose II, a standardized 40-foot Express Cruiser, is equipped with a Model M-6 Van Blerck

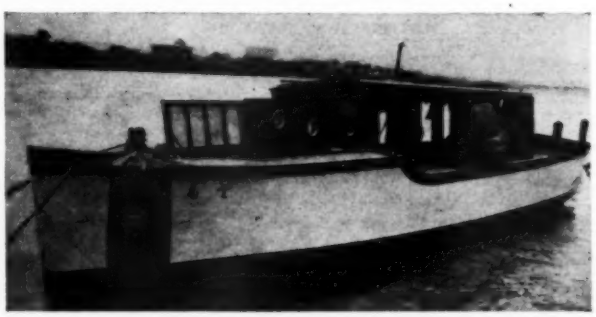
The wave of standardization as spread throughout the eastern and middle western districts has extended to the Pacific Coast. One of the prominent examples of the improved construction methods as applied to boat building is shown in the express cruiser Rose II. She was built at the Wilmington Boat Works, Wilmington, California, and is a thoroughly standardized 40-foot boat. Her owner, J. J. Cornelius, is one of the leading spirits back of the wonderful new yacht club building now being built for the Los Angeles Athletic Club. He has selected a model M6, six cylinder Van Blerck engine equipped with the Van Blerck fuelizer which makes possible a complete control of the boat from two miles to its maximum of 22 miles per hour. One of the principal requirements of the boat is that she is to be comfortable for fishing for the tuna and sword fish which abound in the waters of the Pacific.

canned fuel in a device equipped with a regulator enables a complete control of the flame to be had at all times. Sterno canned heat in 8-ounce cans is used in the Sterno stove and its simplicity has much to commend it. The fuel can be lighted and extinguished as often as necessary until the fuel is entirely consumed. The solidified fuel used is absolutely safe. It does not melt or spill while burning, cannot explode, evaporates slowly and can be secured readily in all parts of the country. There is no evaporation when not in use.

Scored Cylinders Can Be Saved

The patented process for repairing scores in damaged cylinders used by L. Lawrence & Co. and their numerous service plants in many parts of the country has saved many cylinder castings which otherwise would have been junked. This process will repair injuries to castings and when they are refinished it is difficult to locate the injured spot. Cracks in water jackets and other parts of machine castings can be as readily made sound again. A silver nickel alloy is used in this process which is electrically fused into metal of the casting. Cylinders which have worn out of ground can be restored with perfect compression and the repair work will permit of many years' additional life from the motor. Small sand holes or defects in castings can be quickly cured.

Speejacks, the new 98-foot yacht built for A. Y. Gowen, was launched at the yards of her builders, the Consolidated Shipbuilding Corporation, Morris Heights, New York, on April 9. Mrs. Gowen was sponsor for the new yacht and christened her Speejacks in the accepted style. It is intended to make a tour of the world in 1922 on this boat, leaving New York in the fall of that year. It is estimated that this trip will consume a full year and cover 38,000 miles.



The Japanese are quick to see the advantages of American marine motor design. Tomoe, the 30-foot boat shown here, has been equipped with a new Knox valve-in-head motor. She was built by the Sumidagawa Shipyard for the Government Railway Department

Export Business is Booming

Reporting a heavy demand for the Marine Motor which they are producing, the Hess Motor Company of Detroit, Michigan, are well pleased with the number of these they have been able to export recently. The single cylinder motor with a bore and stroke of 3¼ x 4 inches develops 5 h.p. at the maximum revolution rate.

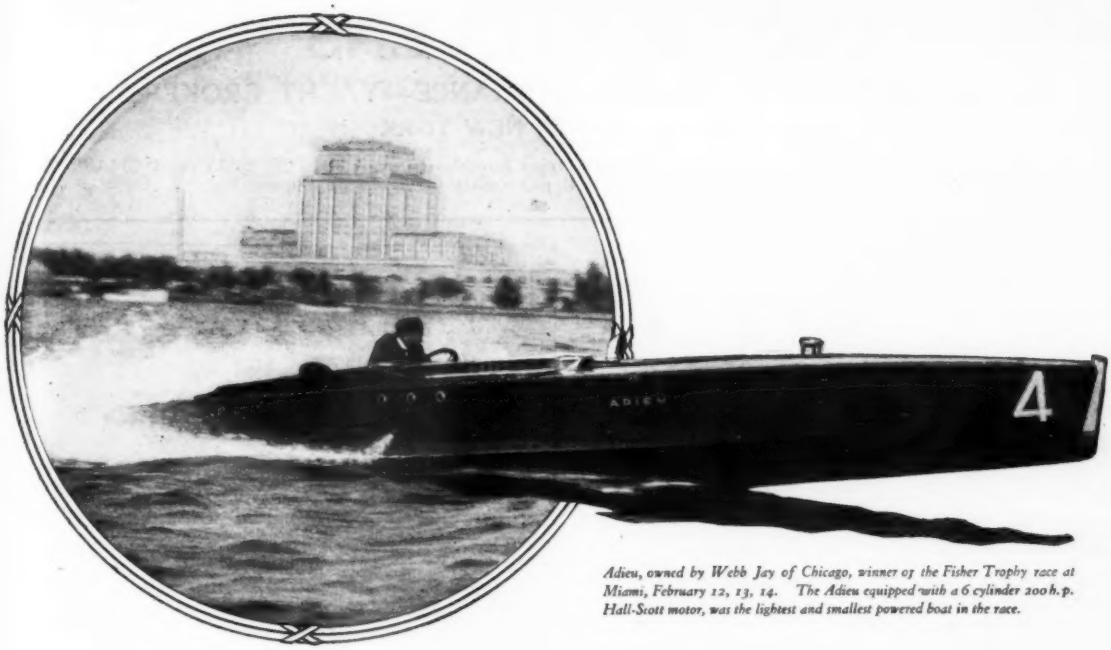
A Carburetor for Every Boat

In the study particularly of carburetion conditions as applied to marine motors, the Wheeler Schebler Company of Indianapolis have found that a type designed for the particular requirements of the individual boat is essential. On account of the low grade of fuel common to-day many difficulties have to be eliminated. The power, economy, flexibility and efficiency developed by the new model Schebler carburetors are convincing proof of how well the problem has been solved.

A Thirty-Two Foot Stock Cruiser

A stock cruiser which any motor boatman will be proud to own is the little 32-footer

(*Continued on page* 100)



Adieu, owned by Webb Jay of Chicago, winner of the Fisher Trophy race at Miami, February 12, 13, 14. The Adieu equipped with a 6 cylinder 200 h.p. Hall-Scott motor, was the lightest and smallest powered boat in the race.

Adieu lifts Fisher Trophy—

She's Valsparred, of course!

Adieu, the latest Hacker built runabout, has lifted the Fisher Trophy, bringing this coveted prize to America for the first time.

Here was a great race, won on its merits. A blanket would have covered the contestants during most of the three 50-mile heats. When the gun announced the finish the bow of Commodore H. B. Greening's Rainbow all but lapped the Adieu's transom—just three seconds behind.

Two Hacker ideas are embodied in the Adieu—one new, the other ten years old. The new idea is the Adieu's "rocker" keel line—the old idea is "Valsparred throughout."

For ten years Valspar varnish has been a standard Hacker specification. Hacker folks know that Valspar is proof against rain or salt spray, blazing sun, spattering oil or gasoline —that Valspar never turns white.

Runabouts to liners, *"Anything that's worth varnishing is worth Valsparring"*

VALENTINE & COMPANY

Largest Manufacturers of High-Grade Varnishes in the World — Established 1832

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The Varnish That Won't Turn White

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Special Offer

For your dealer's name and 15c in stamps, we will send you a 30c sample can of Valspar—enough to finish several square feet of surface. Fill out Coupon.

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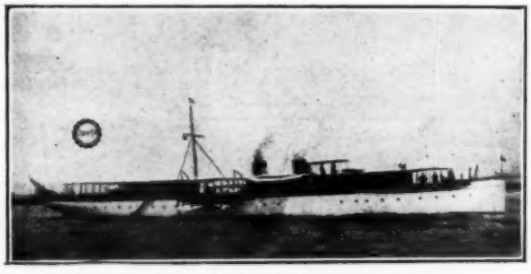
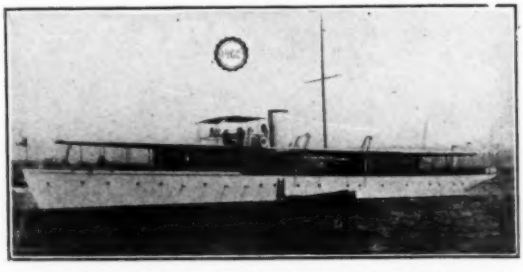
NAVAL ARCHITECTS—MARINE INSURANCE—YACHT BROKERS

15 WILLIAM STREET, NEW YORK

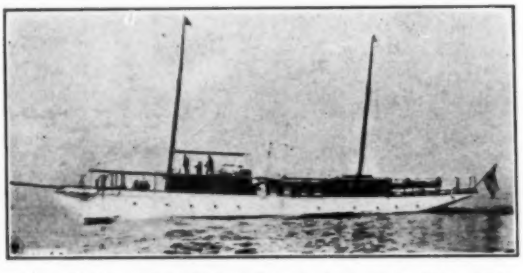
Complete list of all steam and power yachts, auxiliaries and houseboats available FOR SALE and CHARTER. A few are shown on this page. Plans, photographs and full particulars furnished on request.



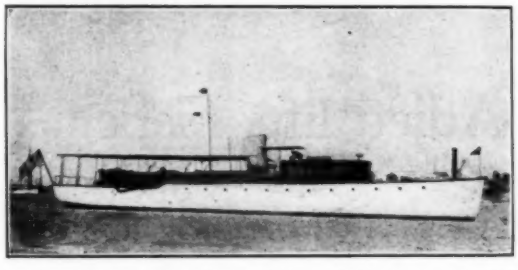
No. 3047—For Sale—Particularly attractive 165 ft. fast oil-burning twin-screw, steel steam yacht. Speed up to 19 miles. Beautifully finished and furnished. Large accommodation includes dining saloon and music room on deck, six staterooms and three bathrooms below aft. Cox & Stevens, 15 William Street, New York.



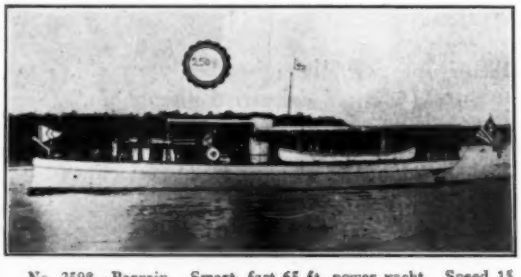
No. 1466—For Sale or Charter—Particularly desirable 140 ft. twin-screw steel cruising power yacht. Speed up to 18 miles; two 300 H.P. Standard motors. Dining saloon and social hall on deck; 3 double and 1 single staterooms, 3 bath and toilet rooms, etc. Recently overhauled thoroughly at large expense. In splendid condition. Cox & Stevens, 15 William Street, New York.



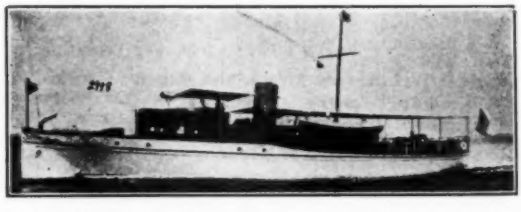
No. 40—For Sale—Flush deck steel steam yacht, 140 x 110 x 18 x 7.6 ft. draft. Has two deck houses, after one being used as a social hall. Quarters handsomely furnished and well laid out. Boiler and engine new 1916. Speed up to 14 miles. Cox & Stevens, 15 William Street, New York.



No. 463—For Sale—Steel, twin-screw cruising power yacht; 110 x 17.6 x 6 ft. Speed up to 14 miles. Two 100/125 H.P. air-starting, reversible Standard motors. Accommodations include deck dining saloon, main saloon, two double and two single staterooms, bathrooms, two toilets. Handsomely finished and furnished. Cox & Stevens, 15 William Street, New York.

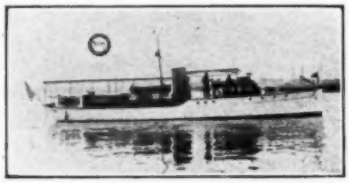


No. 2508—Bargain. Smart, fast 65 ft. power yacht. Speed 15 miles; 125 H.P. Standard reversible motor. Dining saloon, separate galley, double stateroom, bath, etc. Cox & Stevens, 15 William Street, New York.



No. 2978—For Sale—Desirable twin-screw cruising power yacht; 80 x 14 x 4 ft. Speed 13 miles; two 50/60 H.P. Twentieth Century motors new 1919. Dining saloon, two double staterooms, bathroom and two toilets, galley, etc. Recently thoroughly overhauled at large expense. Cox & Stevens, 15 William Street, New York.

No. 3151—For Sale or Charter—Particularly desirable twin-screw houseboat; 77 x 17.6 x 3 ft. Speed 11 miles; two 6 cyl. 60-70 H.P. Standard motors new 1919. Large deck-house containing social hall; main saloon, two double and two single staterooms, two bath and toilet rooms, etc. Handsomely finished and furnished. Cox & Stevens, 15 William Street, New York.



No. 3533—For Sale—Fast 72 ft. twin-screw cruising power yacht. Speed up to 17 miles; two 6 cyl. 125-150 H.P. Winton motors. Dining saloon, two double staterooms, bath and two toilets, galley, etc. Cox & Stevens, 15 William Street, New York.

No. 3483—For Sale—Unusually roomy 60 ft. bridge deck cruiser. New 1917. Speed 11 miles. 60 H.P. Sterling motor. Large dining saloon, two double and one single staterooms, two toilet rooms (one with foot tub), large galley, etc. Complete equipment. Price reasonable. Cox & Stevens, 15 William Street, New York.

Advertising Index will be found on page 126

NAVAL ARCHITECTS
ENGINEERS
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MARINE INSURANCE

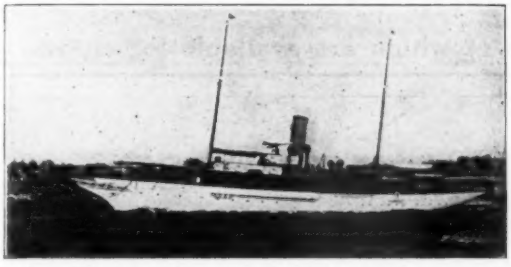
HENRY J. GIELOW, Inc.

25 WEST 43rd STREET, NEW YORK

Tel.: Murray Hill 9134
Cable Address:
Crogie, New York
A.B.C. Code

Plans and specifications for new yachts of any size or type should be prepared now to assure delivery for next year. Have plans of new yachts, all types, on file now.

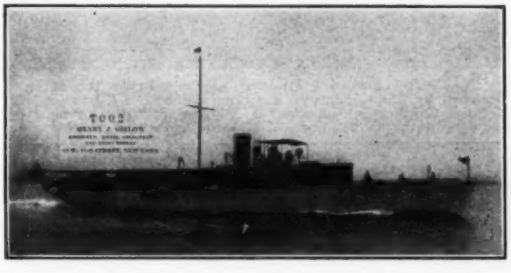
We have a most complete and up-to-date list of steam and motor yachts of all sizes, sail, auxiliary, and houseboats on file in our office, kept constantly up-to-date by a thorough and comprehensive canvass of the entire yachting field from time to time. We are in a position to submit full information on any type of boat upon request.



No. 9597—For Sale or Charter—Handsome 162 ft. seagoing steam yacht, second to none of her size. Finest condition and perfectly appointed. Cruising speed 12 knots. Steel construction, thoroughly overhauled and refitted throughout, 1919. Mahogany and teak trim. Deck dining saloon and music room. Large bridge deck. Two double and four single staterooms, 2 baths. Ice plant, steam heat. Large water supply and liberal cruising radius. Price reasonable for yacht of size and type. Henry J. Gielow, Inc., 25 W. 43rd St., New York City.

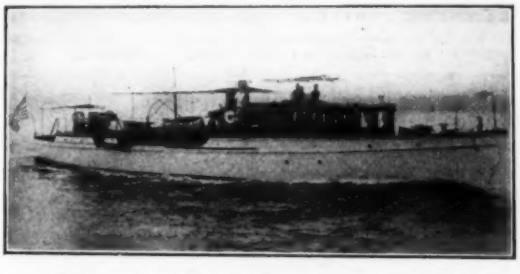
No. 7010—For Sale—Offered at bargain price this 112 ft. twin-screw Lawley motor yacht. 2 deckhouses containing dining saloon and social hall. 2 double and 2 single staterooms, large main saloon, bathroom. Exceptionally well built, able cruiser. In excellent condition. Henry J. Gielow, Inc., 25 W. 43rd St., New York City.

No. 8080—For Sale—Charter—New modern 85 ft. twin-screw cruising houseboat. Deck dining saloon and galley. 2 double, 3 single staterooms. Hot water heat, 3 baths. Shoal draught makes attractive type Florida cruising. Two 50 horsepower motors give speed 10 miles. Good sea boat. Henry J. Gielow, Inc., 25 W. 43rd St., New York City.



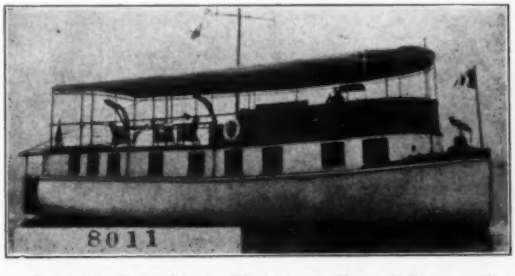
No. 7002—For Sale or Charter—Finest yacht of type available. 138 ft. twin-screw power yacht. Two 300 H.P. Standard engines. Dining room and social hall on deck; three double and one single staterooms; two bathrooms. All furnishings new 1920. Henry J. Gielow, Inc., 25 W. 43rd St., New York City.

No. 7297—For Sale—Attractive high grade 48 ft. twin-screw express cruiser. New Van Blerck motors and upholstery 1920. Speed 21-24 miles. Excellent sea boat through shoal draught, and desirable for Southern and Northern use. Two cabins and separate galley. Crew forward. Bridge deck enclosed in removable glass partition. Cockpit aft. Modern in all appointments. Henry J. Gielow, Inc., 25 W. 43rd St., New York City.



No. 7040—For Sale—Bargain—Modern Lawley built 96 ft. twin-screw motor yacht. 15 ft. beam. Standard motors. Speed 11 miles. Deck dining saloon, 2 double staterooms. Accommodate seven. Economical, can run with 4 crew. Able sea boat. Furnishings new 1919, includes player piano. Large bridge and good deck space. Fine condition. Henry J. Gielow, Inc., 25 W. 43rd St., New York City.

No. 7077—For Sale—Particularly desirable 80-foot twin-screw power yacht. "20th Century" 50/60 H.P. motors, new 1919. Deck dining room, two double staterooms, bathroom. All furnishings and equipment new 1919. Excellent condition. Henry J. Gielow, Inc., 25 W. 43rd St., New York City.



No. 8011—For Charter—Most commodious 51-foot cruising houseboat available. Standard motor. Large deck space. Two double and two single staterooms. All good condition. Henry J. Gielow, Inc., 25 W. 43rd St., New York City.

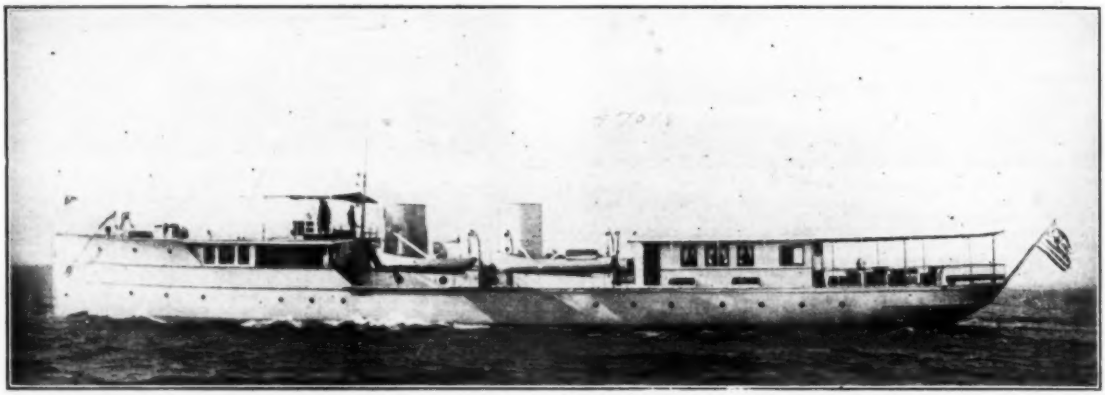
TAMS, LEMOINE & CRANE

NAVAL ARCHITECTS AND YACHT BROKERS

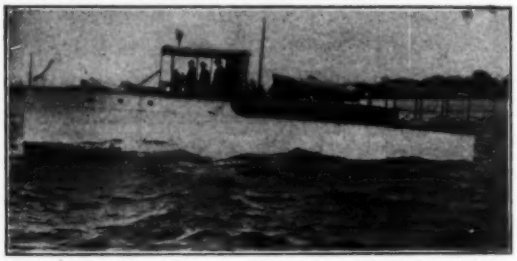
Telephone 4510 John

52 Pine Street New York City

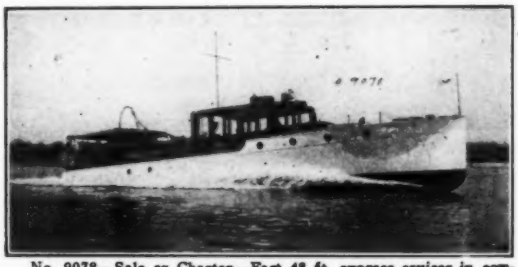
Offer for sale the following yachts, some of which are available for charter



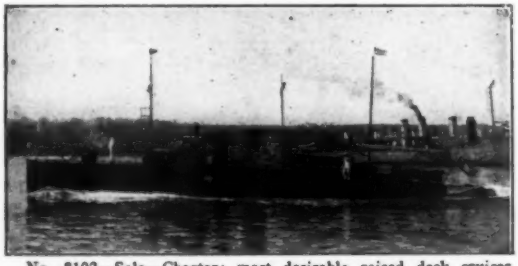
No. 7098—Unusual opportunity to purchase the largest cruising steel motor yacht afloat—140 ft. overall—19 ft. 6 in. beam—6 ft. 6 in. draft. Designed by Tams, Lemoine & Crane and built by Lawley. An exceptionally able yacht. Triple screw having three 6 cylinder. Speedway motors. Gasoline consumption low. Speed 16 miles per hour. Large cruising radius. Has very commodious owners' quarters attractively fitted and furnished. In absolutely A-1 shape throughout.



No. 7474—Sale—Brand new fast cruiser; 2-6 cylinder Sterling motors. Speed 21½ miles. All modern conveniences.

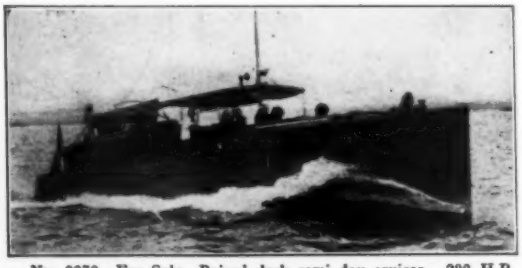


No. 9078—Sale or Charter—Fast 48 ft. express cruiser in commission. Immediate delivery—2 new 6 cylinder Van Blerck motors. Good accommodations. Thoroughly overhauled last year in all departments.



No. 8102—Sale—Charter; most desirable raised deck cruiser available. Practically new. 81 ft. x 13 ft. x 5 ft. draft. Speed 15 miles. Electric light, hot water, heat and refrigerating plant.

No. 9075—For Sale—Desirable raised deck cruiser 70 ft. x 11 ft. x 4 ft. Good accommodations. Speed 23 miles.



No. 8978—For Sale—Raised deck semi day cruiser. 200 H.P. Sterling motor. Speed 20 miles per hour. In the very best of condition. Price reasonable. Full particulars and plans from Tams, Lemoine & Crane, 52 Pine Street, New York.

No. 1927—Sale—Charter—Very desirable, twin screw houseboat; 5 staterooms, 3 bathrooms, dining saloon, lighted by electricity and hot water heat.

Advertising Index will be found on page 126

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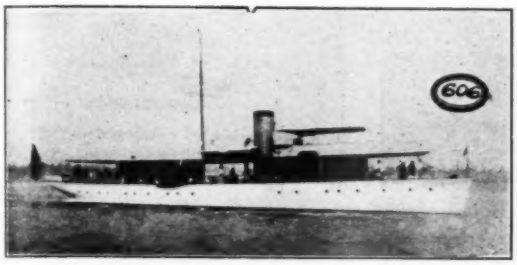
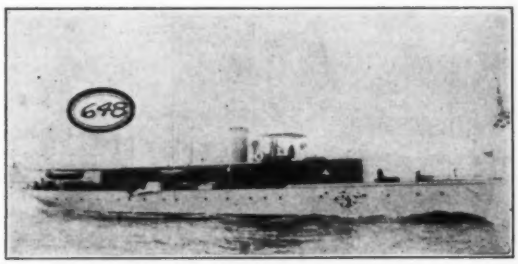
Naval Architects, Yacht Brokers, Surveying, Marine Insurance

We have a complete list of all Steam and Power Yachts, Auxiliaries and Houseboats which are offered for sale and charter

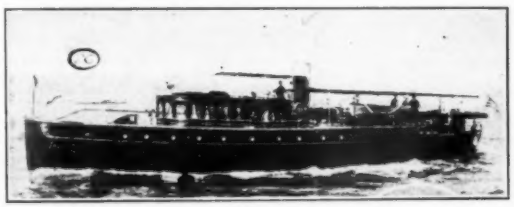
Plans, Photographs and full particulars furnished on request.



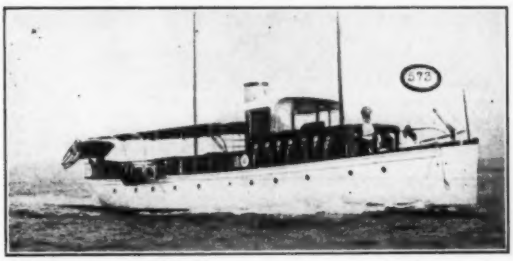
No. 606—For Sale—Modern steam yacht, 123 ft. x 17 ft. x 6 ft. draft. Speed up to sixteen miles. Three single and two double staterooms. Dining and social hall on deck. In excellent condition throughout. The finest yacht of her size available. Edward P. Farley Company, 6 North Michigan Ave., Chicago, Ill.



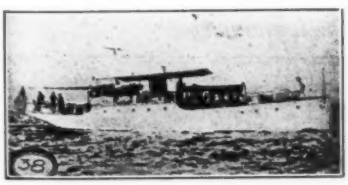
No. 648—For Sale—140 ft. fast twin-screw, steel power yacht. Dining and social hall on deck, three double, one single staterooms, three baths, etc. Excellent condition throughout. Edward P. Farley Company, 6 N. Michigan Ave., Chicago, Ill.



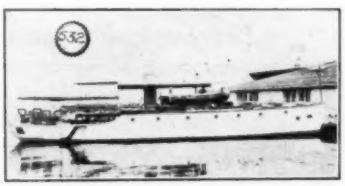
No. 26—For Sale—100 ft. twin-screw power yacht of recent construction and thoroughly modern in all details. Has exceptional accommodations consisting of three double and two single staterooms, dining saloon in deckhouse forward. An able and comfortable cruiser. Edward P. Farley Company, 6 North Michigan Ave., Chicago, Ill.



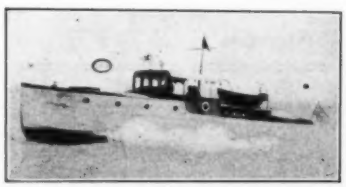
No. 573—For Sale—91 ft. x 14 ft. x 4 ft. 3 in. twin-screw gas yacht. Built 1917. Winton motors. Speed up to sixteen miles. Roomy accommodations with every convenience. In excellent condition. Equipment of the best. Edward P. Farley Company, 6 North Michigan Ave., Chicago, Ill.



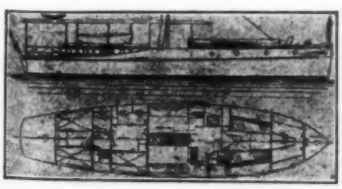
No. 38—For Sale—78 ft. Lawley built cruiser. Winton motor. Two commodious double staterooms. Two toilets. Dining saloon in deckhouse forward. A very able and modern boat. Edward P. Farley Company, 6 North Michigan Ave., Chicago, Ill.



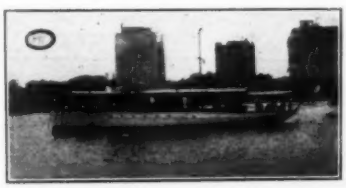
No. 532—For Sale—71 ft. twin-screw flush deck motor yacht. Built by Seabury. Motors controlled from deck. Accommodations consist of one double stateroom, large main saloon, bath, etc. Attractive price. Located Great Lakes. Edward P. Farley Company, 6 N. Michigan Ave., Chicago, Ill.



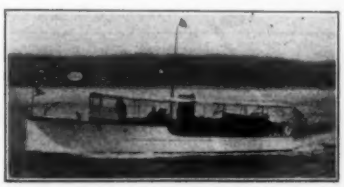
No. 1018—For Sale—54 ft. twin-screw cruiser, express type. Speed 21-24 miles per hour. Two double staterooms, main saloon, two toilets, etc. Complete equipment. Edward P. Farley Company, 6 N. Michigan Ave., Chicago, Ill.



No. 550—For Sale—Raised deck cruiser. 56 ft. x 13 ft. 6 in. x 3 ft. 5 in. draft. Unusually large and comfortable accommodations. Two double staterooms, large main saloon, deckhouse, etc. Finished throughout in the best manner and fully equipped for extensive cruising. Edward P. Farley Company, 6 North Michigan Ave., Chicago, Ill.



No. 451—For Sale—85 ft. x 15 ft. 6 in. x 4 ft. power yacht. Attractively furnished and fitted throughout. Equipped for extensive cruising. Two double and one single staterooms, bath, etc. Has deck social hall. (Located Great Lakes.) Edward P. Farley Company, 6 North Michigan Ave., Chicago, Ill.



No. 1019—For Sale—60 ft. Speedway express cruiser. Excellent seaboat. Speed up to 26 miles per hour. Accommodations excellent. Price reasonable. Edward P. Farley Company, 6 N. Michigan Ave., Chicago, Ill.

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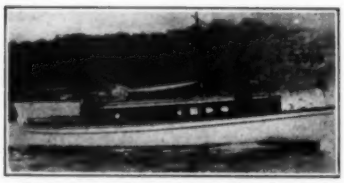
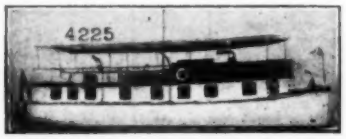
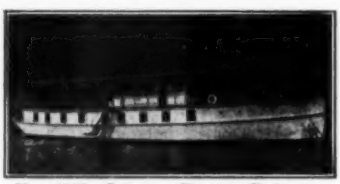


No. 1525—43 foot cruiser. Four berths in main cabin and one in engine room. Toilet, etc. 24-30 H.P. 20th Century motor. 4 cylinders. Speed 9-10 miles. Electric lights, etc.



No. 4225—Sale or Charter—51 foot power houseboat. Three staterooms, main saloon, toilet. 32-37 H.P. Standard motor. Speed 8 miles. Electric lights. Very comfortable boat.

No. 2144—60 ft. yacht. Draft 2 ft. 8 in. Two double staterooms, main saloon, large deck saloon, bath, etc. 60 H.P. Sterling motor. Speed, 10-12 miles.



No. 4322—Sale or Charter—Twin-screw 85 foot power houseboat. Five staterooms, dining saloon, three baths, etc. Speed 10 miles.

No. 2220—30 foot V-bottom mahogany speed launch. Hand design. Six cylinder "E" special Van Blerck motor. Speed 30 miles and over.

No. 2136—Sale or Charter—Twin-screw 80 foot power yacht. Two double staterooms, dining saloon, etc. Two 220 H.P. Standard motors. Speed up to 21 miles.

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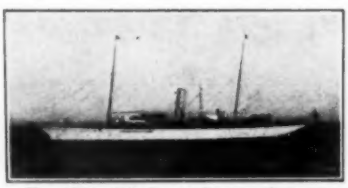
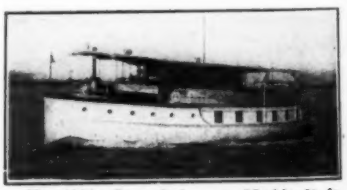


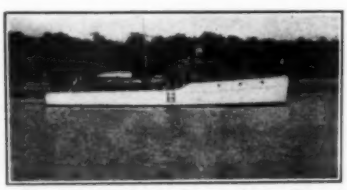
No. 1236—200 ft. steel sea going steam yacht. Best design and build. A-1 condition throughout. Oil burning. One of the finest vessels in the fleet. Frank Bowne Jones, Yacht Agent, 29 Broadway, New York.

No. 5180—110 ft. gas yacht. Lawley build. Twin-screw. Splendid accommodations. Good speed. Frank Bowne Jones, Yacht Agent, 29 Broadway, New York.

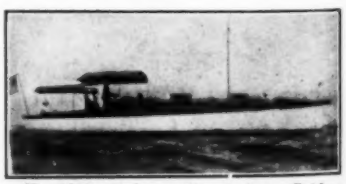


No. 4034—One of the new Mathis 61 ft. power house yachts. Unusual accommodations. Standard motor. Exceptional opportunity. Frank Bowne Jones, Yacht Agent, 29 Broadway, New York.

No. 3413—80 ft. twin screw cruising gas yacht. Lawley build. Practically new. Frank Bowne Jones, Yacht Agent, 29 Broadway, New York.



No. 162—60 ft. express cruiser. Recent build. Twin-screw. Speed up to 30 miles. Frank Bowne Jones, Yacht Agent, 29 Broadway, New York.



No. 3525—50 ft. gasoline cruiser. Bridge deck. Stateroom and saloon. Speedway motor. Speed over 12 miles. Frank Bowne Jones, Yacht Agent, 29 Broadway, New York.

Advertising Index will be found on page 126

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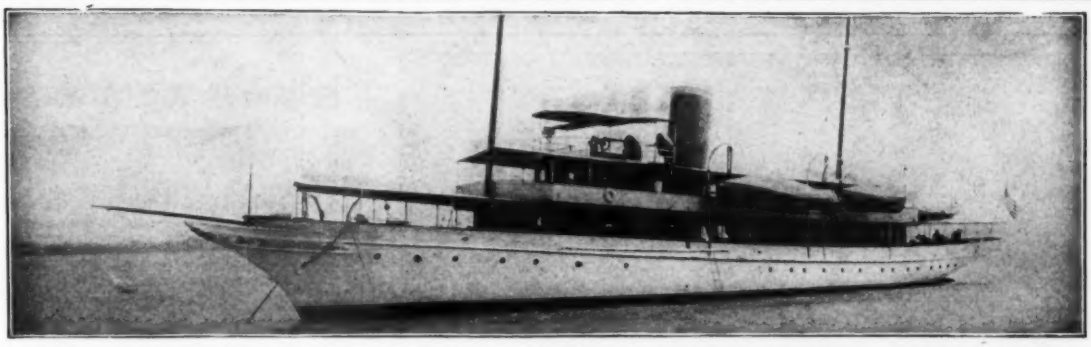
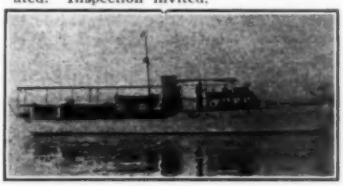
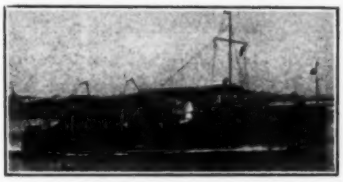


No. 659—Steel steam yacht, deep sea type, 187 x 24 x 10. Of best construction throughout, and of recent build from our designs. Promenade deck full width of boat. Has two large deck houses, with chart house and Captain's room on upper deck. Finely appointed owner's and guests' quarters. Was not used in Government Service. In best possible condition and should be seen to be fully appreciated. Inspection invited.



No. 2456—Able power yacht, twin-screw, 72 x 13.3. Two 6 cylinder Winton motors. Speed 15 knots. Everything first class condition.



No. 2504—Express cruiser, 45 x 10.6, six cylinder Sterling. Speed 14/18 miles. Sleeping accommodations for four, besides crew. A-1 proposition.

No. 2044—Bridge deck cruiser, 63 x 13.6 x 4. Twentieth Century motor, 4 cylinder. Speed 11/12 miles. Attractive interior arrangement.

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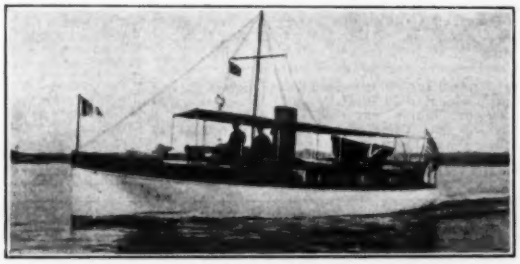
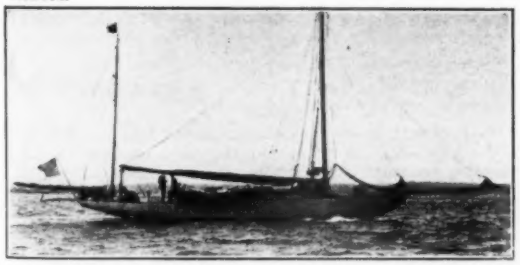
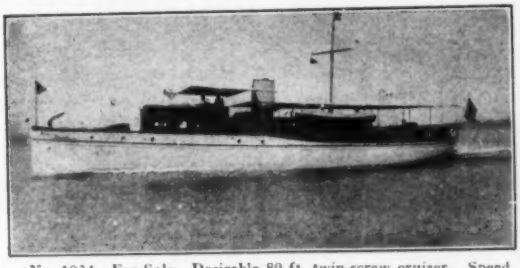
No. 726—For Sale—Unusually high-class 55 ft. express cruiser. Speed 20-25 miles. 1 double stateroom and saloon. Sleeping 8 persons. A yacht expressing individuality which can be recommended.



No. 932—For Sale—Excellent 50 ft cruiser. Speed 14 miles. 1 double stateroom and saloon. Best of construction and very desirable. Very good sea boat and handles very easily.



No. 202—For Sale or Exchange—For cruiser. 60 ft. aux. yawl. Accommodations for 6 persons. Very staunch and able yacht. Will consider trade for 50 to 60 ft. cruiser.



No. 1034—For Sale—Desirable 80 ft. twin-screw cruiser. Speed 14 miles. 2 double staterooms, dining saloon, bath, etc. Excellent condition and a wonderful sea boat.

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The rate for "For Sale" and "Want" advertisements is 6 cents per word, minimum $1.50. If an illustration is used, the charge is as follows, which includes the making of the cut:

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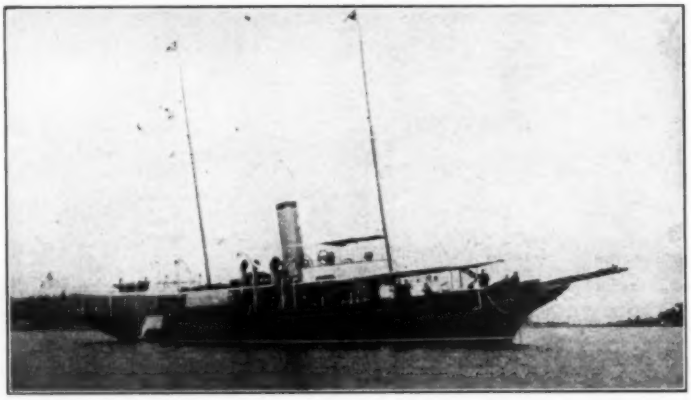


No. 9549—For Sale—Attractive 160 foot steel steam yacht. Deck dining saloon and social hall. Three double and four single staterooms. Two bathrooms. Steam heat. All perfect condition. Henry J. Gielow, Inc., 25 West 43rd Street, New York, N. Y.

For Sale—Raised-deck cruiser. 36 ft. x 10 ft. x 3 ft., 6 ft. 2 in. head room, 2 cabins with kitchenette and lavatory. Completely equipped with collapsible berths and will sleep eight or ten inside. 16-20 Ralaco engine, 4 cylinder, 4 cycle. Speed 9½ miles. Price $3500. Geo. O. Simons, Inc., 546 Asylum St., Hartford, Conn.

For Sale—Several mushroom anchors, red leaded, weight 156 lbs. Net. $12.50 each f.o.b. Washington, D. C., Percy M. Child, 1110 14th St., N.W.

For sale—1 pair Bausch & Lomb prism binoculars, 6 by 30 power. Just the thing to complete your motor boat equipment. Buy now for next season. Percy M. Child, 1110 14th St. N.W., Washington, D. C.

For Sale—High Grade Runabout engine at a bargain. Model F-28-36 H.P. Red Wing. Used one season. Motor was new last spring. Just well broken in. Price with Bosch dual magneto $450.00. Want more speed, reason for selling. Has had best of care. F. H. Miller, 522 Stewart Ave., Ithaca, N. Y.

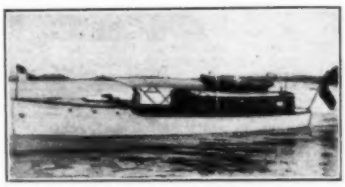
For Sale—Bridge deck cruiser, 42 ft. x 8 ft. 6 in. x 3 ft. 6 in. Good condition. Good sea boat. Heavy duty 4-cylinder 4-stroke engine. Double ignition Bosch magneto and storage battery. Sleep four in separate berths. Four additional on cots, if necessary. Two washrooms and toilets. Complete galley and standard refrigerator; interior white enamel finish. Roomy bridge deck with khaki curtains enclosing same all four sides. Roomy cabin. Good rainy weather boat. Interior white enamel finish. Reason for selling going abroad. Price for quick sale, $2500. Cash —no trades. Ralph Esau, 1200 Otis Building, Chicago, Ill.

For Sale—33 ft. runabout. Brand new 1920. Cedar planked, full mahogany trim. 25-30 H.P. Buffalo runabout engine. Speed 20 miles. Will sell hull or complete boat. N. Wigglesworth, 60 Wilton Ave., Norwalk, Conn.

For Sale—1 2 KW. direct connected Carlisle & Finch electric outfit, with arc search lamp. Percy M. Child, 1110 14th St., N.W., Washington, D. C.

Waterfront—Choice waterfront lots on Pelham Bay, Throg's Neck, Bronx. Easy terms. Ideal location for boat clubs. Room 905, 87 Nassau St., New York City.

For Sale—Elco express, 35 foot runabout with Cadillac 8 cylinder engine. Very completely equipped with cushions, chairs, tools, electric lights and in very good condition. Boat now at Hague, Lake George. Address R. E. Gillmor, care of the Equitable Trust Company, 45th St. and Madison Ave., New York City.



No. 1784—For Sale—Price reasonable. Day cruiser, built 1914. 44 ft x 10 ft. x 2 ft. 6 in. Cruising speed 10 miles. Sleeping accommodations for two forward, large cockpit amidships, engine aft, also toilet room, crew's quarters and galley. Well built. In excellent condition. Apply John G. Alden, 148 State Street, Boston, Mass.

Auto Motor Supplies—Buick—Michigan—Stoddard Dayton—Cadillac—Overland—E.M.F. Continental and Buda Motors, all types $50 each and up. Special high tension 2 and 4 cylinder Magnetos $9.50 each. Electric and Gas Head Lamps—Coils—Carburetors — Air Compressors—Generators—Starters, etc. Write for late catalogue. Address Motor Sales Dep't. B, West End, Pittsburgh, Pa.

4 H.P. Northwestern, 1 cyl., $55. 6 H.P. Gray, $75. 7½ H.P. Ferro, $75. 12 H.P. Fairbanks, 2 cyl., $55. 12 H.P. Atlantic, $105. 12 H.P. Ferro, 3 cyl. and gear, $135. 3 cyl. 5 x 5 Vim, $165. 150 H.P. 8 cyl., air cooled, $245. 16 H.P. Dunn, 4 cyl., $135. 12 H.P. Continental, 4 cyl., $85. 14 H.P. Wolverine, $185. 60 H.P. Big Four, 4 cyl., 6½ x 8, $485. Many others. We buy and trade motors. Badger Motor Co., Milwaukee, Wis.

For Sale—Peerless 2 cylinder motor, 5 bore, 6 stroke. Electric self-starter. Full equipment. Only used two seasons on fresh water. Guaranteed first class condition. Asking $550.00. Will consider reasonable offer, or exchange for 90-100 to 150 H.P. motor, Sterling or Van Blerck preferred with electric starter. Must be in first class condition. J. A. Mellish, St. Hubert Hotel, 120 West 57th St., New York.

All Sizes Rebuilt Marine engines from one to 300 H.P. 4 cyl. 4 cycle GLOBE 10 x 14", reverse gear, magneto, 48" propeller, $3,000.00. Pair STANDARD 300 H.P. 12 x 14" reversible, cost $25,000.00 each, price $4,000 each. Many other large and small four cycle and two cycle engines, for work boats, yacht, cruiser or tender. Write for list.

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These engines are completely overhauled, rebuilt and refinished by our marine engine experts. Look like new, run like new, and are thoroughly guaranteed. Here's a chance to get a high-grade motor at a big saving.

Our present stock includes Sterlings, Domans, Grays, Buffalos, etc., taken in trade for new engines. Write today for latest list if you want a real bargain.

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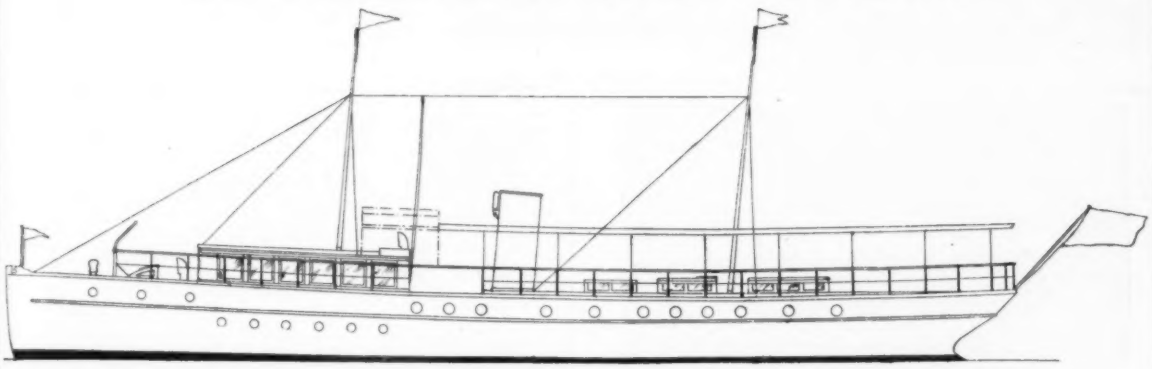
Advertising Index will be found on page 126

FOR SALE

99 Foot Motor Yacht "ESLOMA"



Designed and built in 1920 by Herreshoff Mfg. Co. Cruising Radius 1200 Miles, Cruising Speed, 12 M.P.H., Max. 15. Three double staterooms, 2 baths for Owner and Guests. Wood construction. Now complete at Bristol, R. I. Never in the water.

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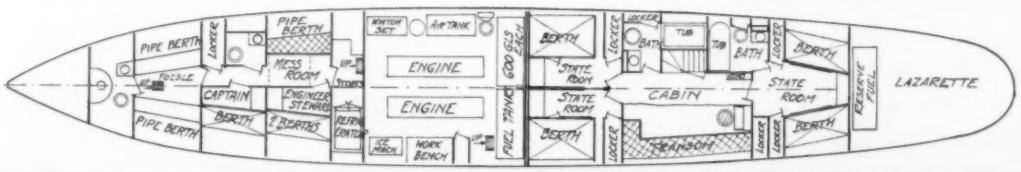
STATE BANK BUILDING
EAST MOLINE, ILL.



Used Sterling Engines—One or pair FM eight cylinder 170 H.P. 5½ in. bore 6¾ in. stroke motors. Full equipment including tachometers, Bosch dual two spark magnetos, Bosch starters and generators. Completely overhauled and in excellent running order. Price $2250 each, cars Buffalo, N. Y. where motors are stored. Hall-Scott Motor Car Co., Inc., Buffalo, N. Y.

For Sale—1, 2-cylinder, 6 H.P. make & break Palmer engine, complete with carburetor, coil, shafting; 4-blade Roper wheel, any speed forward or backward; engine in good running order; owner installing larger engine. First check for $100.00 takes the outfit. Address Walter H. Maynard, Rockwood, Maine.

For Sale—Island near Boothbay Harbor, Maine, about 1½ acres. Wooded—small house, 5 rooms, sun parlor, fire place—all furnished, boat landing and float. Excellent location. Real place at low price. Will take $850 for immediate sale, easily worth $2000. Tel. 767M, E. F. Merrow, 13 Williams Ave., Hyde Park, Mass.

For Sale—Beautiful mahogany runabout hull, 24 ft. x 5 ft. Hand model seam and batten type. Very best material and finish; fore and aft cockpits complete with electrical running lights and bow light. Bitt, shafting, shaft logs, strut, rudder, steering wheel, etc. No engine. W. J. Bowles, 244 W. 122 St., New York City.

For Sale—Modern bridge deck cruiser 50 ft. long, 10 ft. beam. Heavy duty Buffalo engine. Has galley with Shipmate stove, ice box, sink, etc. Dining room, davenports on each side. Engine room with small engine running large Dayton dynamo; also big bilge pump. Edison storage battery and switch board. Bath room with lavatory, bath tub and toilet, tile floor. Main saloon 13 ft. long. Two spring upholstered davenports, green plush. Sideboard with leaded art glass doors. Small size player piano. Everything mahogany. Stateroom with built-in double berth. Dresser with folding wash basin. Three gas tanks and fresh water tank. 12 ft. power tender swings on davits. Will put outfit in A-1 condition for $3500.00 or best offer takes her. Now stored at Spring Lake, Michigan. If interested send for photos. Address Chas. Bimbo, care of Variety Publishing Company, State & Lake Theatre Bldg., Chicago, Ill.

TRIMOUNT WHISTLE BLOWER OUTFITS
Blower runs by friction contact with engine fly-wheel. Whistle of brass, nickel-plated.
Made in 3 sizes.

TRIMOUNT ROTARY HAND BILGE PUMPS
All bronze composition. Suction lift 6 to 20 feet. A lifelong convenience.
Made in 3 sizes.

TRIMOUNT ROTARY POWER CO.
20 Heath Street Boston, Mass.
(Factory: 292 Whiting Ave., E. Dedham, Mass.)

Bargain—150-200 H.P. Sterling 8 cylinder 4 cycle valve-in-head. Excellent condition guaranteed. Price $1000. Paul Laurents, Laurents, La.

Wanted—Crankcase for Model 5 Loew Victor marine motor. State condition and price in first letter. J. W. Clark, 11206-100th Ave., Edmonton, Alberta, Canada.

Bargain—Peerless 4 cyl. 4 cycle unit power plant. Joes clutch, Bosch dual ignition, Schebler carburetor. Force feed oiler. A-1 shape. Price, $300. Paul Laurents, Laurents, La.

90 H.P., 8 cylinder "V" Curtiss OX-5 engines, 4 in. bore, 5 in. stroke, 1400 R.P.M., weight 390 pounds. Brand new in original crates with all accessories, magneto, carburetor, thrust ball bearing, manifolds, ready to run. For sale by U. S. Products Corporation, Kansas City, Mo.

"Hydro"—Blue Prints "Minnow", V, 16 ft., 65c; "Jazz Baby", step, 14 ft.; Tad-Pole, step, 15 ft.; "Jazz", mono, 19 ft., 75c each; "Tornado", step, 17 ft., $1.00; "Hi-Ball", V, 22 ft., $1.00; "Hi-Ball", II, step, 19 ft., $1.50. Address Engineer, No. 768 Barrett Ave., Louisville, Ky.

Canada's exclusive wholesale and retail marine engine jobbers. Dominion's Largest Distributors. Free illustrated catalog, showing over fifty manufacturers' products. Canadian Boat and Engine Exchange, Ltd., Toronto, Canada.

For Sale—Cabin cruiser—ocean going. Flush deck, 52 ft. x 11 ft. x 4 ft. Heavy duty Standard engine. Two lavatories. Two cabins. Mahogany trim. Attractively furnished. One man control. $5,000.00. Canadian money. A. E. Paradine, 38 Munro Pk. Ave., Toronto, Canada.

For Sale—One 4 cylinder, 4 cycle. 20-35 H.P. Sterling engine. Address Box 88, MoToR BoatinG.

For Sale — A 40 ft. raised deck cruiser complete to the minutest detail with every possible convenience. Double stateroom and saloon sleeping five or six. Price $3,000. Cannot be duplicated for double. For complete description address Yachting, c/o MoToR BoatinG.

For Sale—40 ft. 5 in. x 6 ft. 9 in. mahogany runabout "Chinook", speed 25 M.P.H. Equipped with six cylinder 5½ x 6 Van Blerck engine, electric starter, generator, electric lights, windshield, upholstered seats, top and curtains. Boat is in excellent condition and immediate shipment can be made to any point desired. Value $7,500.00; will sell for $5,000.00. Address Winton Engine Works, Cleveland, Ohio.

Wanted—Cruiser 45 to 60 feet long. Must be first class boat. Speed 12 miles or over. Send me particulars. L. Cook, 1918 Sunnyside Ave., Chicago, Ill.

For Sale—One hand V bottom runabout, 25 ft. x 6 ft. x 22 in. draft. Canvas deck brand new. Without motor price $600. With 10 H.P. motor $700. 4 cyl. 4 cycle motor. One 20 ft. x 6 ft. 6 in. with 2 cyl. 2 cycle 5 H.P. Palmer reverse gear, $225. One 29 ft. x 9 ft. glass cabin with 15 H.P. 3 cyl. 4 cycle reverse gear, $800. And others. Apply to George W. Boulden, Elkton, Maryland.

Island on Florida Coast—Beautiful Island of 2,375 acres in Florida Keys. Traversed by railroad, station on Island. Excellent land-locked clear water harbor. Splendid buildings. Other highly valuable improvements. Great assortment tropical fruits and foliage. Thousand acres available for cultivation. Ideal for lime groves and pineapple culture. Also ideal facilities for yachtsmen and anglers' club and game reserve. For particulars write or wire Waters Realty Co., Miami, Florida.

For Sale—4-25 gallon capacity marine stills, steam-operated, complete, never used. NEW—$600 each. Also tanks of any kind. Curtiss-Willis Co., 30 Church St., N. Y.

For Sale—25 ft. motor boat. Fay & Bowen engine. Almost new. Has not run one hundred miles. Can be seen at Calderwoods Ship Yard, Manchester, Mass. Magpie III. Charles W. Smith, 5730 Greene St., Germantown, Phila., Pa.

For Sale—New raised deck cabin cruiser "Half Moon" designed by Atkin and built by Moxley. Size 32 ft. long by 9 ft. beam by 3 ft. draft. Has fine accommodations and splendid equipment. For price and full details including blue prints, specifications and inventory, write Charles A. Ward, S. Fulton Ave., Mt. Vernon, N. Y.

Cabin cruiser—Built by Stearns & McKay, Gloucester, Mass. Length 27 ft.; 30 H.P. Mahogany trimmings. Gray motor. Electric lighting and starting. Fitted with toilet, wash-basin, ice-box, oil-stove, and cabin and cockpit seat cushions. Built 1915 and very little used. Speed 12 to 14 miles per hour. At Bearse's Ship Yard & Marine Railway, Chatham, Mass. Name: "Anne." Address, Mr. Bearse.

For Sale—Old Town canoe—Dinghy, 9 ft. mahogany trim, spruce spoon oars, $80.00 crated, F.O.B. Also two Everwarm safety suits, sizes, 5 ft. 5 ft. 6 in. and 5 ft. 6 in., 6 ft. $75.00 for both. F. Ferrero, Lyme, Conn.

THE MOTOR BOATING MARKET PLACE

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Cut one inch deep, one column wide..... $ 5
Cut 1½ inches deep, 1¼ columns wide..... $10
Cut 2¼ inches deep, three columns wide..... $20

Terms: Cash with order.

Opportunities for the Motor Boatman

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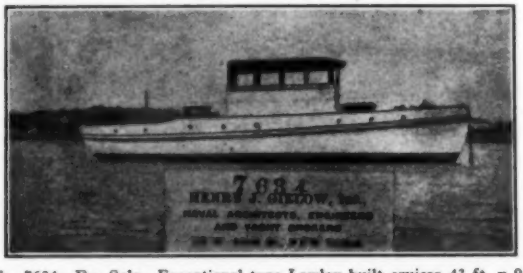
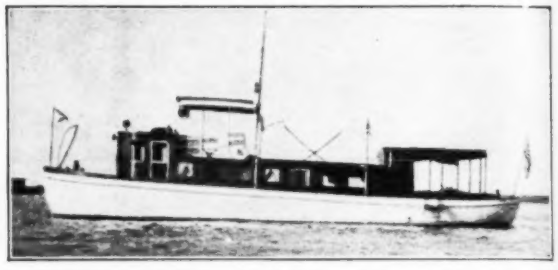


No. 7634—For Sale—Exceptional type Lawley built cruiser 43 ft. x 9 ft. 4 in. x 3 ft. 6 in. Sterling motor. Speed 11-13 miles. Double stateroom and saloon. Attractively furnished and all teak deck trim. Able, comfortable cruiser with deck saloon. Sleeps four. Separate electric plant. Henry J. Gielow, Inc., 25 West 43rd Street, New York, N. Y.

Auxiliary sloop "Peggy", 46 ft. 6 in. over all, 35 ft. water line, 14 ft. beam, 3 ft. 6 in. draft, head room 6 ft. 6 in. Designed and built by Kirk of Toms River in 1908, of white cedar and oak. Carries 1,117 sq. ft. of canvas, a fast and able boat. Have had her up and down the coast in all kinds of weather and never had her decks under water. Has always had the best of care and is in fine condition. Galley 14 ft. long with pipe berth, crew's toilet, large refrigerator, sink, kerosene stove with oven, storage for dishes. Main saloon 12 x 14. Has dining room table in center with center board underneath. Sleeps 2 on one side of table and 3 on the other, Pullman curtains. Bath room, 4 x 6, with bath tub, washstand, toilet. Engine room, 4.6 x 6 with 4 cylinder, 4 cycle Peerless, 25 x 35 H.P. Marine engine (installed 1918), with electric lights and electric self-starter. Cockpit 8 x 10. Ample deck space. Completely equipped. Inspected at Tuckerton, N. J. Price, $2500. J. S. Herkness, 1831 Land Title Bldg., Phila.



Yacht "Avis"—Built in 1908 by Berger. Heavy construction. 52 ft. x 11 ft. x 3 ft. 8 in. Twin-screw. Doman 25 H.P. engines. Electric starters; 3 H.P., 32 volt light plant. Pilot house, two double staterooms, galley and engine room, large cockpit. Fully found. Fine light and air. Great sea boat. Wonderful condition. Over $3,000 spent 1920 fitting out. E. L. Hayward, 209 So. State St., Chicago, Ill.

Exceptional Bargain—Well built 32 x 6 ft. knockabout speed boat. 91 H.P. Model F F Sterling engine. ¾ in. planking. In splendid condition. Speed approximately 28-30 miles. Seen in New York by appointment. R. H. Wager, 149 Broadway, New York.

REBUILT MOTORS

The Engine You Want at the Price You Want to Pay

We carry in stock inboard and outboard motors ranging from 1 to 600 H.P., of all types. These machines are honestly rebuilt in our own shops and sold with an IRON-CLAD GUARANTEE. We recently announced a reduction of 20% in the price of these engines, which brings the prices in most cases down to about 40% of Their Original Cost.

Write us for our Bargain List—it will be sent anywhere on request.

BRUNS, KIMBALL & CO.

153-155-157-159 West 15th Street New York City

We also are distributors of and carry a stock of the following NEW motors —the finest built in this country—

Sterling	Kermath	Murray & Tregurtha	Missouri
Gray-Prior	Peerless	Wolverine	Roberts
Hartford	Waterman	Doman	

R. W. ZUNDEL CO., Inc.

This 6-volt Marine Horn combines distinctive marine appearance with a coarse heavy tone. The horn is of the vibrator type, with a very small current consumption; non-arcing, black enamel face, highly polished brass projector for salt water use. 9″ high, 4″ wide at base, weighs 2⅜ lbs. **Price $9.50**

FIRE PROTECTION

You can always depend on your Pyrene. Price to the Motor Boat Trade $7.50 each.

R. W. ZUNDEL CO., Inc.

44 Whitehall Street

Phone: Bowling Green 9157 New York

BOAT SUPPLIES

SAL SPEEDOMETER for MOTOR and SAIL YACHTS

IS THE ONLY KNOWN DEVICE FOR DETERMINING THE EXACT SPEED OF ANY BOAT. ASK FOR INFORMATION

HAMILTON & HANSELL, Inc., 13 Park Row, N. Y. City

Advertising Index will be found on page 126

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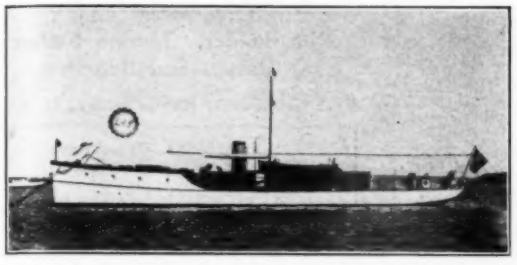
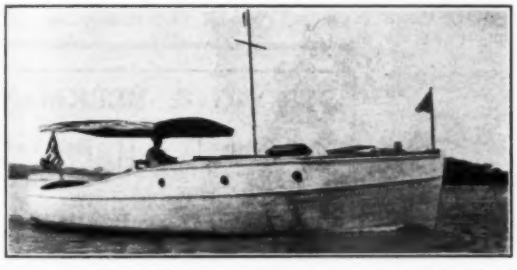
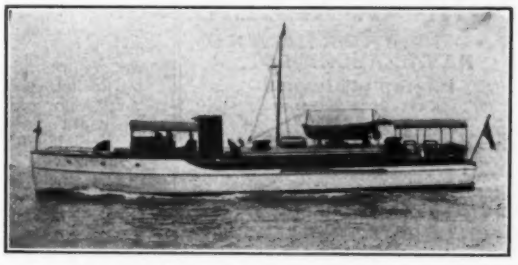


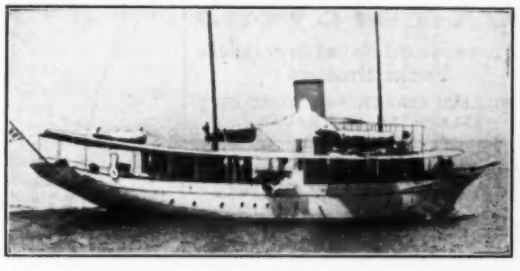
No. 293—For Sale—Roomy power cruiser; 76 x 13 x 4 ft. Speed 13-14 miles. 75 H.P. Standard motor. Galley and crew's quarters forward under raised deck. Engine room amidships containing two berths, washbasins, lockers, etc. Large toilet room between engine room and main saloon. Latter has four Pullman berths, wardrobe, sideboard and table. Spacious afterdeck 18 feet long. Awning full length from bridge aft. Power tender and dinghy. Is fully found and in A-1 condition. Price $7000. Offer wanted. Cox & Stevens, 15 William Street, New York.



28½ foot cruiser, Whittelsey design. Able and substantial. Equipped for cruising. Toilet room forward. Practically new 12 H.P. 4 cycle Palmer double ignition. Have bought larger boat and will sell cheap. Spring overhauling completed. Wm. C. Atwater, Jr., 1 Broadway, New York. Bowling Green 8421.



For Sale—Yacht Celeritus, 61 ft. O. L. x 11 ft. 6 in. x 3 ft. 9 in. Designed by Swasey. Built by Jacobs 1916. Redesigned 1919. Motors overhauled 1920. Power plant, two Sterling eight cylinders 150/200 H.P. each. New power dinghy built 1920. Perfect order. Complete inventory. Price low. Apply Oliver, 417 Canal Street, New York.



No. 926—For Sale or Charter—Handsome, twin-screw, steel steam yacht, 140 x 18.3 x 7.6 ft. Speed up to sixteen knots. Splendid accommodation, including dining saloon in forward deckhouse, social hall in after deckhouse, two double and three single staterooms, two bathrooms, three toilets, etc. All conveniences. Yacht has been thoroughly overhauled and brand-new boilers installed. Has had slight usage and was not in Government service during War. Cox & Stevens, 15 William Street, New York.

New and used marine heavy oil engines. New —55 H.P. Remington. 40 and 50 H.P. August Mitz Corporation. 22 H.P. "C.A.J." 4 cylinder, 4 cycle all with crank shaft and propeller complete. Used—Van Blerck, 20th Century, Premier, Craig, Buffalo and many others for immediate delivery. All at about one-half normal value. For complete information address C. A. J., care of *Fishing Gazette*, New York City.

Boat Builders Wanted—Only experienced men need apply. Belle Isle Boat & Engine Co., Detroit, Mich.

Marine Motor Mechanics Wanted—Must be familiar with overhauling, installing and adjusting marine motors. Belle Isle Boat & Engine Co., Detroit, Mich.

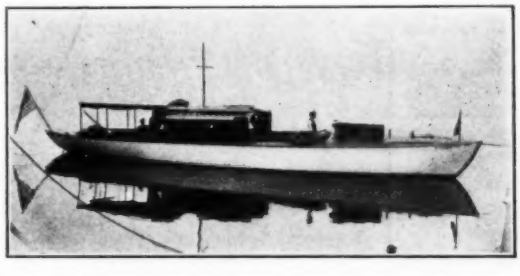
KERMATH MOTORS—WE WILL TAKE ANY MOTOR IN TRADE ON A NEW KERMATH. GET OUR SECOND HAND LIST. KERMATH MFG. COMPANY. (Detroit, Mich.)

The Watercar—A small, high grade, up-to-the-minute express cruiser of unusual seaworthiness and efficiency, ideal for ferry service and week-end cruising for a party of 4 or 5, at an extremely low price. Bronx Boat Works, Foot Willow Ave. (on Bronx Kills, near E. 132nd St.).

For Sale—90 H.P. 8 cylinder, V type Curtiss airplane motor, 4 bore, 5 stroke. Berling magneto, Zenith carburetor. Make wonderful motor for light runabout or hydroplane. I guarantee this motor in first class condition; only used about twenty hours in airplane. Weight 450 lbs. Asking $600.00. Make offer. W. J. Herbert, 530-532 West 44th Street, New York City.

For Sale—Two cylinder, 36 H.P., two cycle Kahlenberg engine. A-1 condition. Complete with spare parts, clutch, shaft, stuffing box, propeller. Box 91, MOTOR BOATING.

For Sale—25 ft. Crosby-built cat boat. 2 cylinder 10 H.P. Lathrop engine. Louis H. Baker, Buzzards Bay, Mass.



No. 1262—For Sale or Charter—At a bargain price. 54 ft. Elco de Luxe day cruiser. Standard motor. Excellent condition. Speed 12 miles. Cox & Stevens, 15 William Street, New York.

SECOND HAND PROPELLORS.

Make	Dia.	Pitch	Rotation	Condition	Dia. Shaft	Taper	Keyway	Price
Hyde	22	22	R	New	1¾	⅝	¼	$20.00
Columbian ...	16	24	R	Good	1	⅜	¼	9.00
Gale	22	24	R	Good	1⅜	⅝	¼	15.00
Hyde	24	24	R	Good	1⅜	⅝	¼	19.00
Hyde	24	24	R	Good	1⅜	⅝	¼	19.00
Columbian ...	22	22	L	Good	1½	⅝	⅜	16.00
Columbian ...	22	18	L	Good	1½	⅝	⅜	16.00
Hyde	32	38	R	Good	2	⅝	½	38.00
Hyde	22	24	R	Good	1½	⅝	⅜	16.00
Hyde	24	24	R	Good	1½	⅝	¼	19.00
Hyde	20	26	R	Good	1⅜	¾	¼	12.00
Hyde	20	24	R	Good	1¾	¾	¼	12.00
Hyde	18	30	R	Good	1⅜	⅝	¼	9.00
No Name.....	18	24	R	New	1¼	⅝	¼	13.00
No Name.....	18	24	R	New	1¼	⅝	none	13.00
No Name.....	14	36	R	New	not bored	..	..	8.00
No Name.....	14	21	R	Good	1 "	⅝	¼	6.00

We have these propellors, some new and some second hand in the above sizes and specifications which we are offering for sale at a ridiculously low figure in order to clean them out. Those propellors listed new are shop worn and those listed as good are second hand but in very good condition. The column headed taper shows that the amount of taper in inches per foot to which the propellors are bored. The prices are absolutely net, terms absolutely cash or C. O. D., providing 25% of full amount accompanies order. First come first served. The Frisbie Motor Company, Middletown, Conn.

NAVAL ARCHITECTS & YACHT BROKERS

JOHN G. ALDEN
YACHT BROKER AND NAVAL ARCHITECT
MARINE INSURANCE
148 State Street
BOSTON, MASS.

Thomas D. Bowes, M. E.
NAVAL ARCHITECT AND ENGINEER
Offices:
Lafayette Bldg., Chestnut and Fifth Sts.
PHILADELPHIA, PA.

COX & STEVENS
Engineers and Naval Architects
Yacht Brokers
18 WILLIAM STREET, NEW YORK CITY
TELEPHONE 1375 BROAD

WAVE COLLECTING
Runabouts—Rowboats—Cruisers
SPECIAL 17' HYDROPLANE
Build your own boat from my plans, full size paper patterns or semi-erected frames.
17 years' practical experience
LOUIS E. GERMAIN, N.A.
600 N. Andre St. Saginaw, Michigan

R. M. HADDOCK
NAVAL ARCHITECT
Sail or Power Yachts, Houseboats and Commercial Vessels
Yacht Broker Sales and Chartering
50 East 42nd St. New York City

William H. Hand, Jr.
NAVAL ARCHITECT
NEW BEDFORD, MASS.
HAND-V-BOTTOM DESIGNS
Send stamps for latest catalog.

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Bowling Green 6077
N. E. McCLELLAND & CO., Ltd.
NAVAL ARCHITECTS
SURVEYORS — YACHT BROKERS

Ventilating Between the Frames

(*Continued from page* 25)

apply and finish and the absence of the bead makes it easily cleaned. The square edge V groove stock cannot be had at every lumber yard ready to apply, but the advantage makes it well worth while to have the stock gotten out special at the mill. For the average cruiser or open boat having frames spaced not more than ten inches on centers, stock ¼ inch or ⅜ inch by 1½ inches will be about right for ceiling. For lockers stock ½ inch by 1½ inches is advised. The width of 1½ inch is not too narrow for any boat, but the width and thickness may be varied to suit individual tastes or special conditions.

In applying the ceiling, start at the top against the sheer clamp and work downward to the floor. As each strip is applied place a thin putty knife blade or other suitable spacer between it and the preceding strip and don't remove the spacer until the ceiling is fastened. This spacing effectually insures against trouble from swelling, and should a slight shrinkage occur the amount at any one space will be so small as to be negligible. Properly filled with colored putty after the application of the filler and stain, the nail-holes may be made to match the wood exactly. It is now customary to finish the cabin interior in white enamel, which eliminates the only objection to square edge ceiling, the nailholes.

Whether ceiling a new boat or refinishing an old one, a liberal application of an approved wood preservative to the planking and frames is far superior to painting. Paint covers the surface but it does not penetrate as the preservative does. Once painted wood has absorbed moisture, very likely from an unpainted side, it is very slow in giving it up, and rot may progress to the destruction of the wood and the paint still show intact. The Paint Manufacturers' Association slogan, save the surface and you save all, applies very well to buildings and the outside of the boat, but it does not apply to the close, damp places on a boat as between the frames and many other similar hard to ventilate space.

W. B. M., Newburgh, N. Y.

An Ideal Cruise for the Inland Salt

(*Continued from page* 36)

expenses under $60.00 each. The figure includes the grub for the party, including the crew of two (the crew owned the boat and furnished the gasoline, oil and kerosene; bedding, except an extra blanket which we each carried), and we lived high. Two chicken dinners, steaks, chops, hams, corn on the cob, tomatoes, cereal, fruit, three fresh caught fish dinners, and all the ale we wanted to drink comprised the menu. Everyone gained, even the old boys laid on about seven pounds each.

Complete maps of the Trent Canal can be obtained by writing the Superintendent Engineer, Trent Canal System, Peterboro, Ont. They will send you information on the fishing seasons, which, by the way, won't bother you, although the gamewardens may, if you haven't a license. They will charge you $5.00 for a license, if you can find anyone to pay it to. The truth probably is that since the Canal must be kept open, and since 99-99/100% of the traffic consists of pleasure craft, from which the small towns take their toll for provisions, the Canadians are glad to let you partake of their plenty and, indeed, Canada invites you.

Advertising Index will be found on page 126

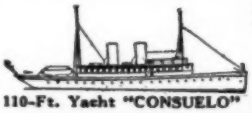
CHARLES D. MOWER
Designer of
SENSIBLE CRUISERS
POWER—SAIL—AUXILIARY
Twenty-five years' practical experience
347 Madison Avenue New York City

FREDERIC S. NOCK
NAVAL ARCHITECT
Yacht Builder, Marine Railways, Storage and Repairs
East Greenwich, Rhode Island, U. S. A.

What do you want—What have you?
C. S. SPONAGLE
Yacht Brokerage and Insurance
Commercial Boats
Competent Crews Furnished
88 Broad Street Boston, Mass.

Boat Headquarters in Baltimore
For quick action list your boat with us.
STALEY'S YACHT AGENCY
Yacht and Ship Brokers
106 N. Charles St., Baltimore, Md.

STRONG & BEEKMAN
Yacht and Ship Brokers
29 Broadway New York
Yachts — All Types, Sale or Charter
Also Commercial Vessels
Tel.: Whitehall 537 Cable: "Strobick"



Sixteen Years
Designing Experience
Specialty
110-Ft. Yacht "CONSUELO" Seagoing Yachts
J. MURRAY WATTS, N. A.
136 South Fourth St. Philadelphia
Phone: Lombard 2072

RALPH E. WINSLOW
NAVAL ARCHITECT
Atlantic, Mass.
Designer of high grade motor and auxiliary Yachts and Commercial Vessels.
Start now to have your 1922 boat designed. Do not wait until winter.

FOR SALE—A limited number of the famous Rutenber Motors, suitable for marine use. These are Model 25, 1920, six-cylinder motors—four-cycle "L" head type, developing 45 B.H.P. at 2400 R.P.M. — Bore 3½ · Stroke 5"—Weight 545 lbs. Completely equipped with generator and starter. These motors would retail between $400.00 and $500.00. We have client that will dispose of a limited number at the remarkably low cost of $295.00—without generator and starter $265.00. These motors are new and carry the manufacturer's guarantee. Terms 25% with order—balance C.O.D. Address orders to Seelye & Brown, Inc., 721 Cass Ave., Detroit.

22-Foot Sea Sled, weight 4200 lbs. with two passengers. Speed 35.92 miles an hour with four-cylinder 125 H.P. Hall-Scott. Owned by H. J. L. Stark, Orange, Texas.

Expectation vs. Realization

FEW boats greatly exceed the expectations of their designers. The 22-foot Standard Sea Sled is one of the few. Designed for a maximum speed of 32 miles an hour, a four-cylinder 125 H.P. Hall-Scott marine engine was installed, and a speed of 35.92 miles an hour was obtained over the official U. S. Navy course in Boston harbor.

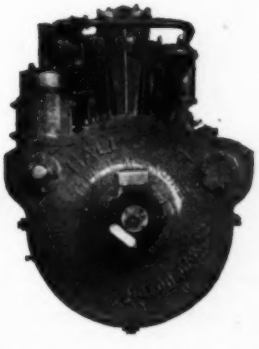
Performances of this nature naturally appeal to all boat owners, particularly those who are continually calling for "better" marine engines.

The Hall-Scott is a "better" engine, both in design and mechanical construction.

Hall-Scotts are easily installed, replacing older and heavier types. They add greatly to the general efficiency of a boat, giving greater sustained speed, burn less gasoline and operate with much less trouble than any other of the higher speed marine engines in fast cruisers and runabouts.

We have Hall-Scott engines in stock, ready for immediate shipment.
Write us to-day for full information, stating your requirements.
Two sizes only,

Four Cylinders 125 H.P., weight 1100 lbs.
Six Cylinders 200 H.P., weight 1300 lbs.



HALL SCOTT

MOTOR CAR COMPANY, Inc.

266 Main Street, Buffalo, N. Y.

Factory, Berkeley, Calif.

DENSMORE

Standardized Cruising Yacht

The first standardized yacht of its size, quality and completeness to be built. A marvel of comfort and completeness.

J. M. DENSMORE COMPANY

Offices: 79 Milk St., Boston Plant, Atlantic, Mass.

J. M. DENSMORE—*Naval Architect*
RALPH E. WINSLOW—*Consulting Naval Architect*

NEVER before has a standardized yacht of this size, quality or completeness been built. In materials, workmanship and finish the DENSMORE is the best that experience and money can produce.

This remarkable yacht is now procurable completely equipped, constructed from a design of demonstrated merit and embodying every feature that contributes to comfort, elegance and pleasure.

We have designs for all classes of boats, each developed with the greatest care and thought by foremost naval architects. Our execution is unsurpassed.

Allow us to submit sketches and prices to meet your requirements.

We will also estimate on plans by your own naval architect.

The Way We Would Do It

(*Continued from page* 38)

to the proper way of accomplishing this alteration. Can I use a flexible joint where the change in direction of the shaft occurs. W.L.C., Mount Vernon, N. Y.

It is perfectly feasible to instal a universal joint or flexible coupling in a shaft line providing certain limitations of these devices are borne in mind when making the change. The construction of the universal joint will not permit it to transmit any thrust along the shaft. It is necessary so to instal the joint that a thrust bearing is placed in the line between the propeller and the universal joint. If this is not done the thrust will be transmitted through the joint and result in rapid heating and excessive friction. The ideal way of installing a joint of this kind is to have a steady bearing immediately fore and aft of it and a thrust bearing can be combined with the after steady bearing.

The necessity for a universal joint can be avoided if the center line of shaft is extended forward to the new engine position. This will tend to raise the motor higher in the boat which may be objectionable but this method will be perhaps simpler than the installation of the coupling.

* * *

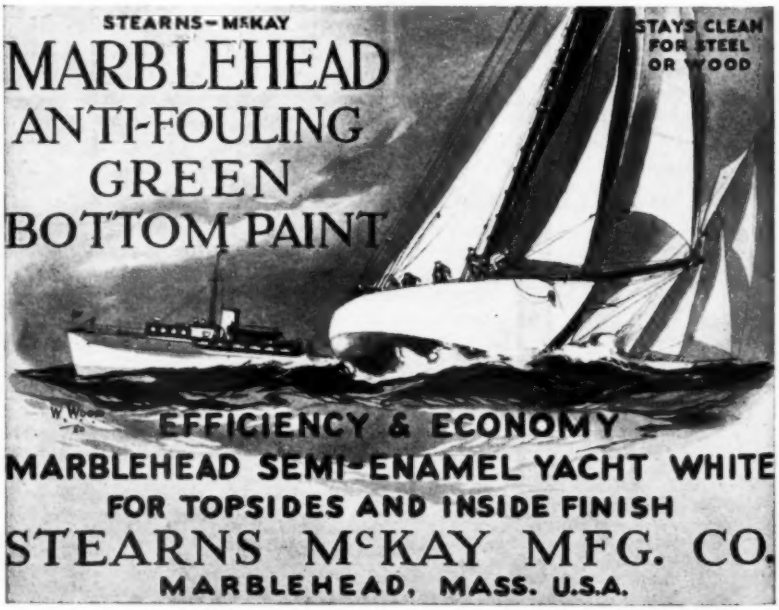
Will you kindly give me an idea of a sail which would be suitable for that 9-foot easy-to-build dinghy which you published in the January issue of MoToR BoatinG. What speed could I get by installing an outboard motor under the stern seat with the propeller underneath the boat? D.G.M., Alameda, Cal.

This little boat was not primarily designed to carry either sail or an outboard motor. A little sail however could be carried and serve to move the boat. The sprit sail which is shown in the sketch will answer better than any other type. The dimensions are, a mast about 9 feet long, a boom 7½ feet long, and a sail of about 42 square feet in area.

The installation of an outboard motor under the seat in a boat as small as this would not be practical. The space available is not sufficient to properly house and support such a motor. A better method would be to strengthen the transom a trifle and hang the outboard motor over the stern in the accepted manner.

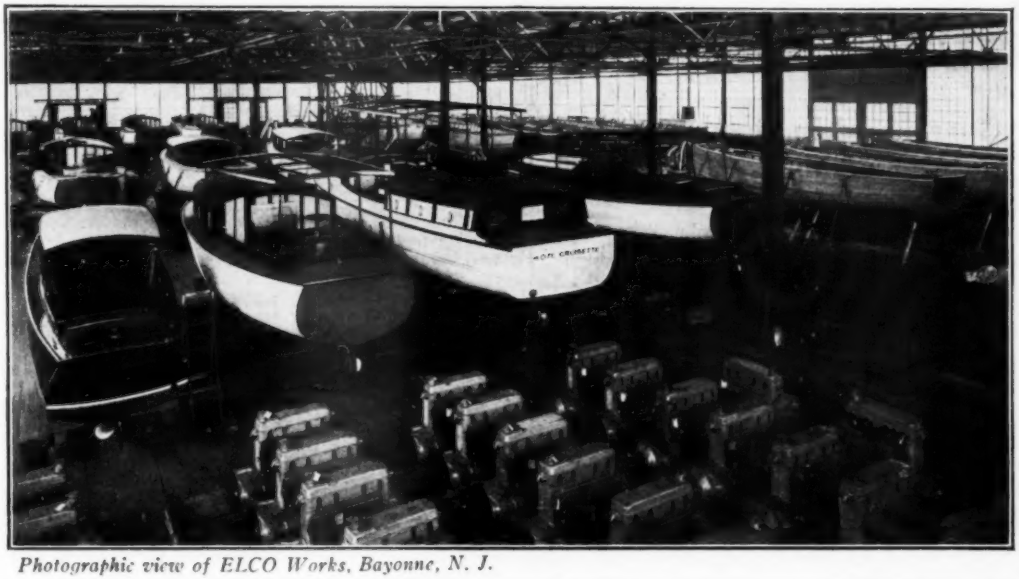
If the reader who wrote an inquiry from the Canadian Patent Office at Ottawa will send us his name which was omitted from his letter, we will be glad to answer his questions.

STEARNS-McKAY



EFFICIENCY & ECONOMY
MARBLEHEAD SEMI-ENAMEL YACHT WHITE
FOR TOPSIDES AND INSIDE FINISH
STEARNS McKAY MFG. CO.
MARBLEHEAD, MASS. U.S.A.

Advertising Index will be found on page 126



Photographic view of ELCO Works, Bayonne, N. J.

ELCO Superiority a Result of Standardized Construction

TAKE a trip through the ELCO Works at Bayonne, New Jersey, if you wish to see the advantage of Standardized Construction as applied to Motor Boats.

By seeing them in their various stages toward completion, you will understand immediately how ELCO Cruisettes, Cruisers, and the other ELCO models are built in accordance with specifications from which there can be no careless or accidental deviation.

Standardization from keel to the last fitting eliminates any possibility of faulty workmanship, makeshift adjustment, or the inclusion of defective materials. Every part is made to fit into its place exactly, having first undergone a rigid examination. There can be no departure anywhere from the standardized requirement.

All this is made perfectly clear as the visitor goes through the ELCO Works, seeing these staunch and beautiful motor boats as they assume shape and progress to the point at which they are ready to be launched.

Finally, when each ELCO Motor Boat is complete to the last detail, it is tried out thoroughly, and must fulfill every established requirement including standardized performance of the engine under all conditions, before it is released for delivery.

It is because of this standardization of construction and performance that ELCO Motor Boats are the *staunchest, most seaworthy and most beautiful motor boats ever built.*

It is because of standardized construction, too, that ELCO Motor Boats are *cheaper than any other motor boats of their dimensions.*

These are facts that you will appreciate immediately when you visit the ELCO Works.

ELCO Motor Boats challenge comparison for these important qualities:
Staunch Seaworthiness.
Comfortable roominess.
Graceful lines—Easily Sustained Speed.
Reliability and Economy of Power Plant.
Quality of workmanship and materials.

Elco

THE ELCO WORKS
Main Office and Works:
201 Ave. A, Bayonne, N. J.
Via C.R.R. of N.J. (Liberty Street Ferry)
NEW YORK OFFICE: 11 Pine Street

Standardized Models for immediate delivery

33 ft. Cruisette—Speed 12 miles
40 ft. Cruisette—Speed 11½ miles
30 ft. ELCO Express—Speed 20 miles
36 ft. ELCO Sedan—Speed 32 miles
50 ft. ELCO Cruiser—Sleeps 8 persons

Rebuilt Engines

All Guaranteed in Good Running Condition

1 R.H. and 1 L.H. 5¾" bore, 7" stroke, Wisconsin marine motors. Complete with ignition, carburetion, and Seabury reverse gears.
Price—$5,000 for the pair.

1 R.H. and I L.H. 3-cylinder 7½" bore, 9" stroke, Automatic heavy duty motors. Complete with propeller shafts, propellers, and propeller equipment.
Price—$850 each or $1,700 for the pair.

1 R.H. and 1 L.H. 8-cylinder 6¾ x 7¾ Duesenberg high speed marine motors. These motors are complete with standard equipment.
Price—$5,000 for the pair.

1 R.H. and 1 L.H. 8-cylinder Model F-300 Sterling engines. Complete with standard equipment.
Price—$3,500 each.

1 4-cylinder 28 H.P. Clifton marine engine. Equipped with imported Bosch magneto.
Price with standard equipment—$1,000.

1 50-Light Murray & Tregurtha direct connected set.
Price—$250.

1 Model F M 8-cylinder 5½ x 6¾ Sterling engine. New. Has Bosch electrical and ignition equipment. Engine complete with propeller equipment.
Price—$2,500.

1 R.H. and 1 L.H. 6-cylinder 6½" bore, 8" stroke, open base Murray & Tregurtha engines.
Price—$3,000 each.

1 Model F-4 4-cylinder 7½" x 10" heavy duty M. & T. engine.
Price—$2,500.

1 4-cylinder 6½" bore, 9" stroke, old style 20 H.P. M. & T. engine.
Price—$700.

1 R.H. and 1 L.H. 4-cylinder 6½ x 8 Model E-4 M. & T. engines.
Price—$1,400 each.

1 4-cylinder 8½" bore, 11" stroke, 60-80 H.P. M. & T. rebuilt engine.
Price—$3,000.

1 Universal 37 Ampere direct connected light set.
Price—$250.

1 Herrischoff steam plant.
Price—$2,800.

All Engines Subject to Prior Sale

MURRAY & TREGURTHA CORPORATION

Atlantic Massachusetts

Hippo' Makes Ready for Her 7,000-Mile Voyage

(*Continued from page* 9)

who is co-owner of Hippocampus, is no more a windjammer than I am, but already he swings a wicked paint brush, and there is that about him which tells me that he'll be full of verve and pep long after I'm too tired to haul on a sheet or lean my weight against the tiller. When it comes to an emergency the crew will be there and the skipper may take his shut-eye with a clear conscience.

My difficulties in obtaining a crew were coincidental with my efforts to procure a proper boat to put them in. At first blush it seemed an easy task to find a yawl of 30- or 35-foot overall length, powered with a 12 or 15 h.p. motor, and capable of holding together in a double-reef breeze. My ex-navy friend who suggested the cruise had in mind a sloop that could be had for $300 or $400, and he argued that because she had stayed afloat for thirty or forty years she could reasonably be expected to last through another season. But I preferred a craft with divided sail, and when he withdrew from the venture I didn't bother to inspect this ancient packet.

Nevertheless I did spend a day in Newport, looking over a sloop of twenty summers that had been used successfully for pilot duty out of Narragansett Bay. She was a work boat with trim, yachty lines, and as she bobbed at her mooring in a swell working its way in from the sea she had a nice buoyancy that was fascinating. A recollection stole over me of the good old days on the sub-chasers when we shot the heavens while holding on with our shoulder blades or lay prone on the chart-house deck to pore through the tables of Bowditch, and I wondered if I could be happy at sea in any craft that wasn't lively and frisky. On the point of signing along the dotted line, I was deterred by the suggestion of a friend that I give him opportunity to inquire into her soundness.

He made inquiry of a disinterested boat builder, and I learned to my regret that the sloop was a whited and red-leaded sepulcher. She was good superficially, but her heart was false, and she could almost be guaranteed to open up when the nearest land was directly underneath me. That was enough. I have cruised the top side of the Atlantic and to some extent along both edges of it, but I have no desire yet to explore its shady side.

Upon my return to New York from this fruitless expedition I began a tour of investigation that was as disheartening as it was comprehensive. Whenever I got wind of a yawl that was within my means I found that she had been sold the day before, and each time I lost consciousness at sight of photographs and specifications of the ideal boat I was brought to with the intelligence that she could not be bought for less than five figures. As I went from yacht broker to editor and from friend to philosopher my spirits ebbed and ebbed, and on a hot, sticky day of March I abandoned the idea of the cruise. More from force of habit than from any remaining vestige of hope, I dragged my ex-sea-going legs to the office of another yacht broker and told him the story of my disappointed ambition.

Mr. Simon Fisch listened sympathetically and agreed emphatically that there was not an auxiliary on the market of the length of hull and pocketbook that I specified. "But," he continued brightly, "I have the disposal of a 28-foot auxiliary yawl that answers your other requirements, and if you care to come down in length and go up in price there's not another boat in America that will better suit you." He reached into a drawer and withdrew plans, specifications, and photographs of the 28-foot Helenette II, and I knew from that moment that the cruise would go on. Details of inspection, of purchase, and of completing my crew would come later. I dated the history of my cruise to Frisco from that moment.

So now while Helenette II, her name changed back to the original Hippocampus, lies at a yard in New Rochelle waiting for launching on a high tide that accompanies the next full moon, I come to a description of the craft to whose timbers and rigging has been entrusted the task of taking us to the Golden Gate. Already, after only a month's acquaintance with her, she has taken a place in my affections that no other boat has occupied, and my appreciation of her is growing day by day. When she changes hands again—as she must at the conclusion of the cruise—I know that I shall mourn the passing of a tried and faithful friend.

Hippocampus, as she was christened when launched by E. J. G. Yalden, of Leonia, N. J., was built in 1916 and is as new to-day as she was when water first kissed her keel. Designed by Fred Goeller, Jr., she embodies his ideas of what a small, sea-going yawl should be; and built by Neils Jacobsen, of Nyack, N. Y., she boasts a ruggedness and honesty in which any yachtsman must glory. Mr. Yalden put much of his own time and enthusiasm into the building of his yawl, and personally satisfied himself that every stick that went into her was of the finest quality. After her completion he sailed her for a few months, and then, a multiplicity of other interests engaging his attention, he sold her to William F. Caesar, of New York.

(*Continued on page* 60)

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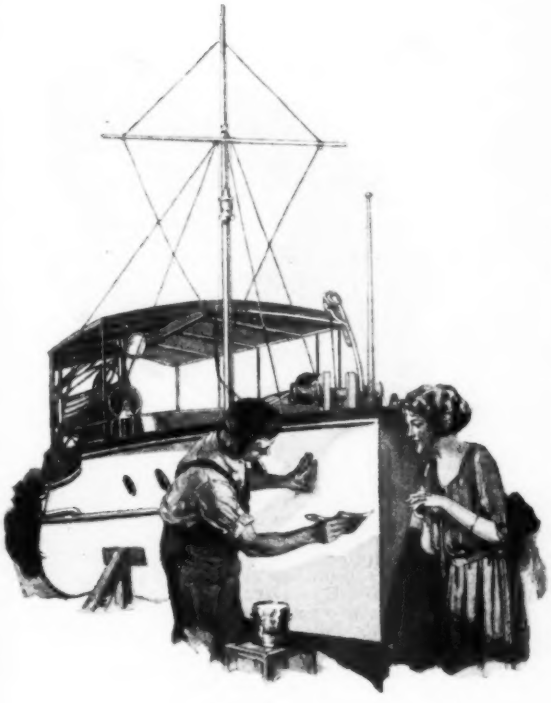
DEVOE



Yours--when you use Devoe —

the benefit of 166 years of experience

WHY is it that the same basic materials used in identical proportions by different manufacturers, produce a finished product vitally different?

The secret lies in manufacturing methods and experience.

Devoe Paint Products are produced by the oldest paint manufacturing concern in the United States. They are backed by a wealth of skill and knowledge that only 166 years of quality paint-making experience can develop.

Consequently, when you specify or use Devoe Products on your boat you have the satisfaction and assurance of knowing that you are getting a maximum of beauty, purity and final *economy*.

There is a Devoe Paint Product for every marine requirement. If you want information on any paint problem, write us.

Manufactured by

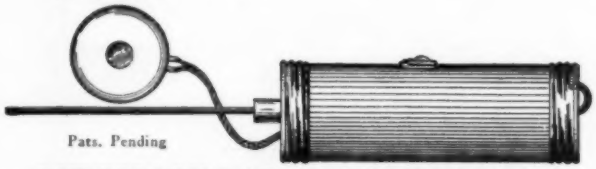
Devoe & Raynolds Co., Inc.

New York *Paints, Varnishes, Stains, Enamels, Brushes, Insecticides* **Chicago**

DEVOE & RAYNOLDS CO. INC. THE FIRST AMERICAN PAINT MAKER FOUNDED 1754

Are you overhauling your own boat this season?

THEN there is a sure way to test your own motor,—to be *certain*, in advance, that your power plant starts the season in perfect condition. Our famous



Pats. Pending

MECHANICAL STETHOSCOPE

will enable you to detect *instantly*, any knock, grind, or other trouble, anywhere in the running machinery of your motor boat. A little practice with the mechanical stethoscope will make any motor boat owner as proficient as a mechanic with years of experience. Hundreds of mechanics have long depended on the stethoscope daily. This wonderful instrument is now offered direct to you at the low price of only

$7.50 by mail, postpaid

The stethoscope will be an invaluable aid for keeping your motor in perfect running condition thruout the season. ***Takes the uncertainty out of motor boating.*** Guaranteed to work exactly as stated in instructions, or your money refunded without question. Send in your order *to-day*. Your stethoscope will come by return mail, in time to use before the season starts!

GENERAL SOUND TRANSMISSION CORP.
Suite 507, 2 Rector St., New York
Responsible dealers are invited to write for profitable sales plan.

Vibration

existing at one or more speeds of a

MARINE ENGINE

is frequently caused by lack of balance of crankshaft or propeller.

Such Vibration can, and should be, eliminated, by proper balancing of the rotating parts of the engine, on an

NWA Balancing Machine

This company, under the guidance of Mr. N. W. Akimoff, whose initials form its trade mark, has an enviable record of success in the solution of vibratory problems.

WE SOLVE NWA VIBRATION PROBLEMS
Trade Mark Registered

Ask the maker whether your motor, in the new boat you are planning to buy, will be perfectly balanced on an NWA Balancing Machine.

VIBRATION SPECIALTY COMPANY
Harrison Building **Philadelphia, U. S. A.**

Hippo' Makes Ready for Her 7,000-Mile Voyage

(*Continued from page* 58)

If the origin of Hippocampus was auspicious, her ownership under Mr. Caesar was no less favorable, because he considered her the finest of the dozen or more boats that he has owned, and kept her at the top notch of her efficiency. He has sailed and lived aboard her for four seasons, and this spring she needed only paint, varnish, and a rearrangement of her fuel and water tanks to fit her for a trip around the world.

Hippocampus, as has been said, is a 28-foot auxiliary yawl, but she is the biggest ship of her inches that ever put to sea and stayed there until her owner was ready to bring her in. She has a beam of 9 feet 11 inches, a waterline length of 23 feet 3 inches, and a draft of 5 feet. A keel boat, with iron on her keel, and shaped iron ballast inboard, she is declared to be as steady as a rock and as able as a battleship. If this is so my first mate and I will miss that old sub-chaser roll, but my second, who never saw anything in the war more exciting than a few big advances with a battery of French seventy-fives, may rejoice that he won't have to learn to anchor himself to his bunk by personal magnetism.

She is laid out with a chain locker and stowage space forward communicating without bulkhead or partition with a large trunk cabin in which there are two full length bunks. Between them forward is a Goblet Dolan toilet, and on the starboard side aft is a narrow chest of drawers followed by a full-length clothes locker. Tucked away in the clothes locker is an acetylene gas tank which lights a single jet on the starboard side. On the port side abaft the bunk is a miniature galley with two-burner oil stove, and behind and around and underneath that stove there is more plate and pan shelfage than would be expected in a boat of twice 28 feet.

Beneath the companionway ladder (and here we come to the part of the boat that reminds me of the Long Island Railroad slogan—"This may save your life to-day") is a two-cylinder, two-cycle, 8-10 h.p. Palmer engine connecting to reversing clutch and 20 x 24-inch Thompson feathering propeller. The motor has been used long enough in five years to wear it in thoroughly and remove its pristine stiffness, but the former owner was a sailboatman primarily and used his power only when going through extremely narrow winding passages. The same procedure will be followed under the present ownership, but as I am unaccustomed to obeying the behest of calms and contrary winds I may turn more often to the flexible, controllable power of gasoline.

To that end the 30-gallon water tank on the port side of the narrow cockpit has been converted to a gasoline tank, giving a total of 60 gallons' fuel capacity and a cruising radius under power alone of about 200 miles. Two new 40-gallon Koven tanks, especially made for Hippocampus, have been installed in the forepeak, and with 80 gallons of water available we hope to struggle through a possible but unhoped-for tour at sea of as much as a month. If the boat were larger the tank capacity would be greater, but under the circumstances we shall have to control our thirst or satisfy it otherwise than with water.

Aside from the tank rearrangement, the only change in the boat's equipment is the installation of a pipe berth with kapok cushion. By this means the sleeping accommodation has been comfortably increased to three; and inasmuch as one man will always be on watch at sea, the pipe berth will only be required in port. As a means of insurance against future trouble rather than because of present necessity the yawl has been provided with a suit of new 10-oz. sails, which we expect to break out and bend on when we strike the northeast trades.

The cockpit is no more than a narrow well, but there is ample deck room on either side of it, while abaft it is a lazarette into which a two-months' supply of provisions can conveniently be stowed. Hippocampus is controlled by tiller, and under jib and jigger is said almost to steer herself.

The navigational equipment is no more than is required for a trip of this nature, but is perhaps a little more inclusive than the average for a boat of the length of Hippo—to give her at the outset her inevitable nickname. Most important is an eight-day chronometer purchased from the Navy and of the type used on sub-chasers and other small naval craft. If it runs according to form it will have a losing rate for a week or so, a gaining rate for the succeeding two weeks, zero variation for the following nine or ten days—and so on. But if it does no worse and is abused no more than the chaser instruments were it will see us through with satisfactory accuracy.

Next on the list in point of interest comes an octant which I purchased from an Austrian in Trieste shortly after the termination of the war. Were it stamped with a Teutonic name I should have reason to distrust it, but as its point of origin was Cardiff, I believe it to have been taken from a submarined Britisher, and so respect it intrinsically as well as sentimentally. It

(*Continued on page* 122)

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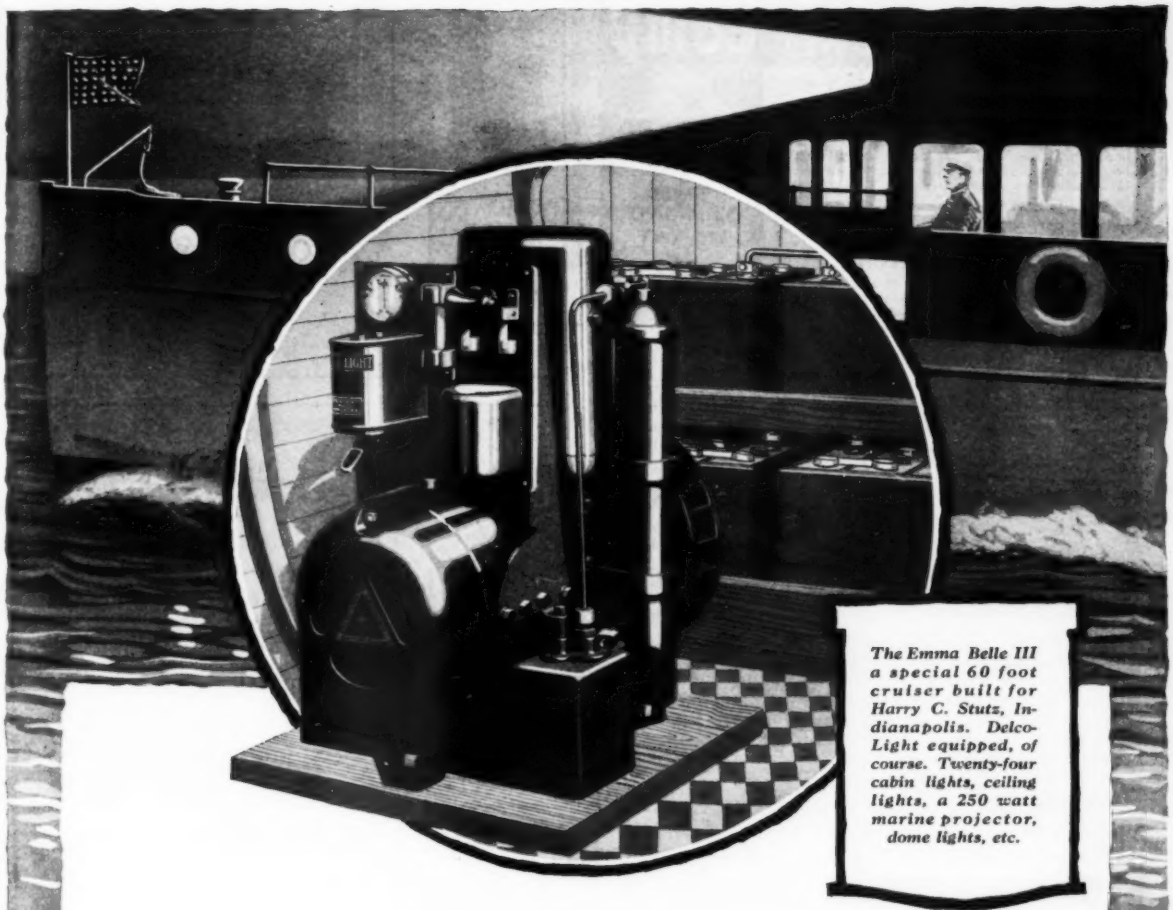


The Emma Belle III a special 60 foot cruiser built for Harry C. Stutz, Indianapolis. Delco-Light equipped, of course. Twenty-four cabin lights, ceiling lights, a 250 watt marine projector, dome lights, etc.

Electric Light for the Motor Boat

You can have electric lights—bright, cheery, safe—on your boat this summer.

Delco-Light is independent of your power equipment; it is compact, safe and simple to operate. Used successfully on yachts, cruisers, launches and sailing craft.

The upkeep cost is less than that of kerosene lamps.

Plants in 16, 32 and 110 volts to meet any requirements. Prices $295 and up, f. o. b. Dayton

DELCO-LIGHT COMPANY, DAYTON, OHIO

DELCO-LIGHT

Over 135,000 Satisfied Users

New 400 Candle Power Lamp

Gives a soft, brilliant, glowing light; restful to the eyes; an ideal illumination.

BURNS 96 PER CENT AIR

100 times brighter than kerosene lamps. Burns 96% air and 4% common gasoline. Lamps and Lanterns for every purpose. Clean—odorless—economical.

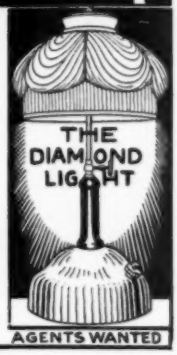
ABSOLUTELY SAFE

Can be carried anywhere—perfectly safe, even if tipped over.

LIGHTS WITH ONE MATCH

SEND NO MONEY — New patented twin mantle burner lights with **one match** easily and quickly. Greatest improvement of the age.

Write for Catalog, Special Agents' Offer, also Money-back Trial Offer. WRITE TODAY.



AGENTS WANTED

THE AKRON LAMP CO. 115 Lamp Bldg. Akron, Ohio

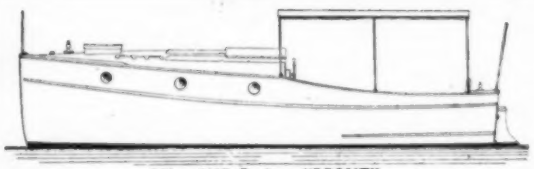
Regular Price $65.00

Reduced Price $28.50

SAVE $36.50

HERE is an opportunity for every motor boat and yacht owner to get a high-grade binocular at a low price. Due to war contract cancellations we have on hand a surplus of 6 power 30 m/m prism binoculars designed for severe service in the U. S. Army and Navy. They are highly endorsed by Government report. Upon receipt of $28.50 we will send you a brand new pair with case and strap—postpaid to any address in the U. S. Use them. Test them for three days. If you decide to return them we will refund your money immediately. For further particulars write to

GRAF OPTICAL CO., Sales Division
503 American Bldg., South Bend, Ind.



26' x 8'6" Cruiser "SCOUT"

The most for the money on the market today. Large cockpit, roomy cabin with toilet, galley and berths for four. Full headroom. Four cycle motor, speed 9-10 miles, fully equipped for cruising, $2500.00.

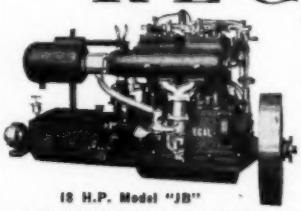
We have a large number of models in both Runabout and Cruisers from which we furnish K D frames to complete outfits. We gladly quote on your requirements.

RICHARDSON BOAT CO.
370 Sweeney St., No. Tonawanda, N. Y.

Twenty Years on the Market

REGAL

—FOUR CYCLE— MARINE ENGINES



18 H.P. Model "JB"

Built for commercial or pleasure boats. Sizes 2 H.P. —weight 125 lbs. to 50 H.P. —weight 5000 lbs. One to four cylinders. Use gasoline, kerosene or distillate for fuel. Easy to start and may be throttled to a very slow speed.

REGALITE—the new Electric Lighting Plant, 2 h.p. air cooled motor, ¾ k.w. generator. Write for information.

REGAL GASOLINE ENGINE CO.
74 West Pearl Street COLDWATER, MICH.

A Real, Low-Voltage Searchlight!

BY far the most powerful searchlight of the incandescent type.

Unlike anything you have ever seen.

Built entirely of brass with our own specially designed heavy glass reflector and bulb.

Furnished in three sizes: 7, 10, and 14 inch for 6, 12, 32, or 110 volts.

Finished in Polished Brass, Black Nickel, and Battleship Gray.

Projects an intense beam of 116,000 to 530,000 Candle Power a distance of One Half to One Mile, depending on size of searchlight and voltage.

Send for Catalog

SOUTHLAND STEAMSHIP COMPANY
Lebby Products Department
Savannah, Georgia

Crockett's Spar Composition is the only varnish which will last a season on a deck

E. Z. VARNISH REMOVER
Film remains soft until removed

THE DAVID B. CROCKETT COMPANY
Bridgeport, Conn.
The Bissell Varnish Company, *Successor*

The Barker Motor

(Two-Cycle)

"Have run my Barker Motor thirty thousand miles in ten years and it is good for ten years more."—Name on request.

Built for long service
Sells at low price

The BARKER FACTORY
Norwalk Conn.

Write for Barker's "Red Letter" Book of Motors

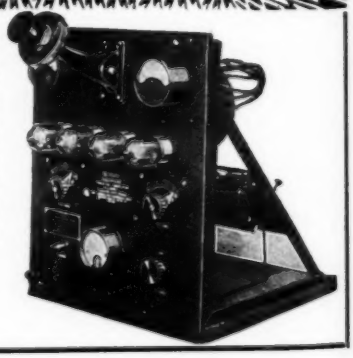
In New York:
TOPPING BROS.
122 Chambers St.

In Boston:
TOPPAN CO.
101 Haverhill St.

In Philadelphia:
KEAN, SHARON & CO.
144 N. Second St.

DE FOREST

WIRELESS TELEPHONE *for* BOATS

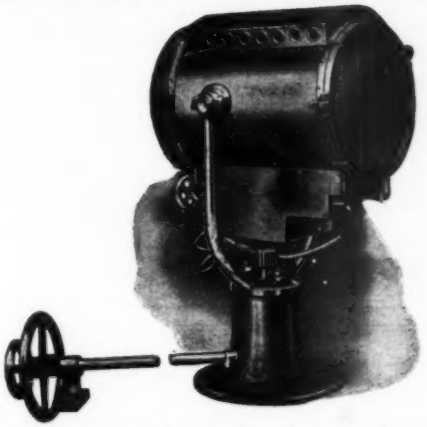


Continuous, Sustained and Reliable word-of-mouth communication over distances up to 30 miles. Absolutely practical and now in successful operation. Easy to use; just talk! Write for full information on the new DeForest Type OT-10 Oscillion "Radiophone" Transmitter.

DEFOREST RADIO TELEPHONE & TELEGRAPH CO.
1415 Sedgwick Ave., New York

Advertising Index will be found on page 126

CARLISLE & FINCH ELECTRIC SEARCHLIGHTS



have for years been the choice of careful motor boat and ship owners. Made in all diameters, from 7" to 60". Used on every size craft from motor boat and yacht to battleship and ocean liner.

The Carlisle & Finch catalog of searchlights will be mailed to any boat owner, builder and marine architect on request

THE CARLISLE & FINCH COMPANY
261 East Clifton Ave. Cincinnati, Ohio

Bites Instantly

The *WC* Navy Anchor takes hold at the first pull of the cable, and the harder the tug, the firmer the hold.

WC Stockless Navy Anchor

Solid wrought iron shank; free from "pin hole." Lies in holding position at angle of 55° to flukes, per Navy Specifications. One piece head; no mud gathering pockets. Tripping fin on head absolutely prevents dragging flukes up. Heavily galvanized by hot process. Proper shackle furnished. At your dealer's or write us.

Can't Foul. Won't Drag.

Get this Valuable Book

"Sea Craft Suggestions and Supplies"; over 275 pages of useful hints about Moorings, Steering Gear, Compasses, etc. Sent only for 50c.

WILCOX, CRITTENDEN & CO., Inc.
4 South Main Street Middletown, Conn.

HARRISON'S
NEW STANDARDIZED
32 FOOT CRUISERS
ARE "REAL BOATS"

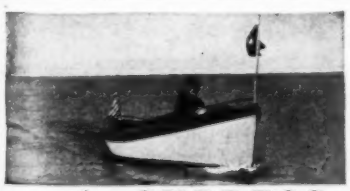
A boat that anyone should be proud to own.

Beauty, speed, seaworthiness, comfort and economy are all available in the HARRISON Cruiser with quality high and price moderate.

We are aiming to meet the requirements of the most particular people.

Descriptive folder and price sent on request.

R. W. HARRISON BOAT WORKS
Bay View Park Toledo, Ohio



He Knew What a trim, stanch, rot-resisting craft his would be if she was

A CYPRESS BOAT

so, naturally he had her built of CYPRESS.

TIDEWATER CYPRESS, "the Wood Eternal," is identified by the CYPRESS trade-mark "arrow." Please write us immediately if you can't find it.

Southern Cypress Manufacturers' Assn.
1317 Perdido Building, New Orleans, La., or
1317 Heard National Bank Bldg., Jacksonville, Fla.

ATTENTION
WE ARE EXPERTS ON BEARING TROUBLES OR LUBRICATION PROBLEMS

Let us work or treat your own bushings of any material, Babbitt, Cast Iron, Bronze, etc., for any service anywhere. Absolutely no hot boxes with loss in valuable Babbitt metals and incalculable loss of time, etc., rebabbitting. You will save 80% in lubrication oils. 300% increase in the life of your bearings. 50% to the life and service of your belting. Reduces friction in bearings with great economy in power and fuel. Overcomes saturation of machinery and workmen with a great gain in output from them.

Designs—Shop Drawings—Layouts

Oil, Gasolene or Gas engines to operate on crude oil to gasolene, two cycle or four cycle, and for any purpose from farm engines to airplane engines. Let us check over plans now made. We often find suggestions which will repay you many times our small fee.

Inventors—We Design, Develop and Superintend

The construction of your first machines and put them on a manufacturing basis.

Models, Patterns, Specifications, Jigs, Fixtures, Dies, Plans of Tractors, Marine Engineering and Installation of Engines and Equipment, Aviation Engines, Water Systems, Lighting, Fuel Tanks, Separators, Piping, Shop Buildings.

PEERLESS ENGINEERING COMPANY
Mechanical-Hydraulic-Electrical-Engineers
Lock Box 1472 CINCINNATI, OHIO

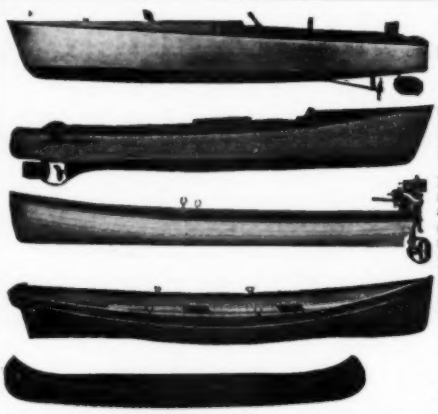
WOOLSEY COPPER PAINTS

and MARINE PAINT SPECIALTIES ARE THE WORLD'S STANDARDS

Copper Paints—Brown, Red and Green, Yacht White, Deck Paint, Marine Mixed Paints, Metal Bottom Paint, Seam Paint, Seam Compounds, Sparon (Spar) Varnish, Engine Enamels, Canoe Enamels, Boat Bottom Seam Compound, Copper Bronze, Light Sea Green and Regatta Green Yacht Bottom Paints, etc.

C. A. WOOLSEY PAINT & COLOR CO.
Jersey City, N. J., U. S. A.

Send for our Marine Booklets, Free—Contain Color Spots and information "How to Paint a Boat."



Motor Boats, Row Boats, Hunting Boats, Fish Boats, and Canoes.

Special Boats for Outboard Motors, Motor Boats 16 to 24 ft. long. For lakes, rivers, shallow water and weeds.

Catalog Free. Save Money. **Order by Mail.** Please state what kind of boat you are interested in.

THOMPSON BROS. BOAT MFG. CO.
1907 Ellis Ave.
Peshtigo, Wis.

DON'T BUY A BOAT

TILL YOU SEE THE

CAPE COD 20-FT. DORY LAUNCH

The Safest Little Family Boat Built. Motor Housed In.
Other Standardized Cape Cod Boats

17' Sail Dory	14' Outboard Motor
16' Shallow Draft	10' Row Boat
17' Life Saving Dory	12' Row Boat

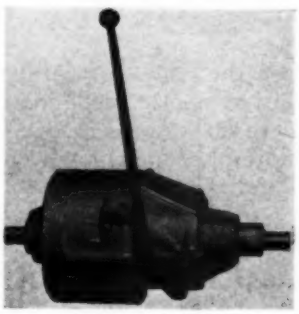
Write for Prices.

CAPE COD SHIPBUILDING CORPORATION

Successors to Cape Cod Power Dory Co.
Builders of craft to 150' length, or 10' draft.

Winter Storage.

Main Office and Works, 367 Main Street, Wareham, Mass.
New York Show Rooms, 412 Eighth Avenue, New York City
Export Office, Factory Sales, 120 Broadway, New York City



MASTER REVERSE GEARS

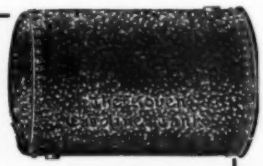
Strictly high quality reverse gears. Multiple disc clutch, nickel steel shaft and gears, hardened and ground, with bronze bushings working on hardened steel pins. Aluminum case saves weight.

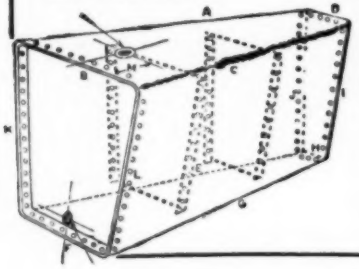
Four sizes transmitting 12, 25, 50 and 85 H.P. respectively per 1000 R.P.M.

Write today for prices.

MASTER MOTOR CO.
19 Price Ave.
Lockport, N. Y.

Gasoline Tanks, Air Whistle Tanks, Mufflers, Stacks, Special Plate and Sheet Metal Work for Pleasure Boats.





L. O. KOVEN & BROTHER

Main Office,
158 Ogden Ave., Jersey City, N. J.

Branch, 50 Cliff St., New York City.

OLOMEL

A Superior Oil and Water Stop Better and Cheaper than Red Lead

Used by Consolidated Shipbuilding Corp., on the

YACHT "LYNDONIA"

also on U. S. Destroyers, and by leading shipyards. Supplied in three forms—Olomel Solution, Olomel Compound and Olomel Putty. We also manufacture Bitumel, Electrimel, Bituminous Enamel, Oxide Iron Paint, Copper Paint, Non-Corrosive Paint, Acid Resisting Paint, Etc.

Write today for full information and prices.

OLOMEL MFG. CO., 18th & HAMPSHIRE STS. SAN FRANCISCO, CALIF.

Rochester 40 Foot Enclosed Bridge Cruiser

High grade cruisers in standard sizes: 36-40-45-50 and 55 feet with either open or enclosed bridge deck.

ROCHESTER BOAT WORKS, Inc.
10 Charlotte Station Rochester, N. Y.

The NJM is the improved Ford marine. It consists of four different models of the same size motor.

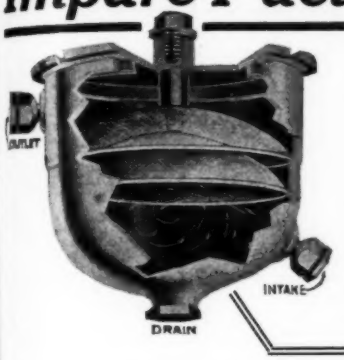
Cylinders 3¼ x 4 cast in block, head separate. Ignition—Splitdorf high tension with impulse starter. Lubrication — semi-force feed. Reverse Gear—Carlyle Johnson. Carburetor—Miller. Open flywheel type, cast iron base suitable for fishing boats, small work boats and cruisers up to 30 ft. in length.

$435.00 F.O.B. Keyport, N. J. Write for literature.

NEW JERSEY MOTOR SALES COMPANY
KEYPORT, NEW JERSEY, U. S. A.

Advertising Index will be found on page 126

Impure Fuel Due to Water! KLEENGAS PURIFIER



Fully 90% of your carburetor trouble is caused by water and dirt in your fuel. You can prevent this trouble entirely with a KLEENGAS PURIFIER.

You can't prevent water from collecting in your fuel tank and line—it condenses from damp atmosphere as well as the water in the gas or kerosene you buy. You can't prevent sediment, dirt, fluff, rust, impurities—some scales off the tank lining—some comes in the gasoline itself. But you can prevent all the troubles caused by these impurities.

KLEENGAS is a high grade PURIFIER scientifically designed, simple in construction and made of the best non-corrosive materials. Aluminum bowl, double parabolic fine mesh bronze screens, brass drain tap at bottom. It cleans itself by the swirling motion, the impurities dropping down so they don't clog the screen. Large capacity allows full gas flow and requires only occasional draining.

Order a KLEENGAS today—$10.00 postpaid. Money cheerfully refunded if not as guaranteed. Hundreds in use. Easily installed—no soldering.

Excellent proposition for distributors and dealers—write

THE NATIONAL AUTOMOTIVE MFG. CO.

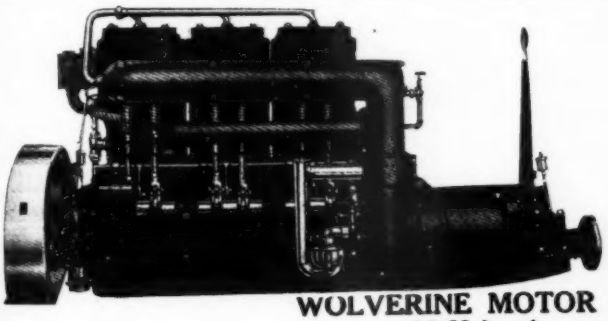
822 CHAMPLAIN AVE., N. W. - - - CLEVELAND, O.

PURDY BOAT COMPANY

Designers and Builders of

EXPRESS CRUISERS

TRENTON **MICHIGAN**



"WOLVERINE"

The Motor with the Bore and Stroke

HEAVY DUTY MARINE ENGINES

KEROSENE { Used successfully for 15 years. Device built into engine.

WOLVERINE MOTOR WORKS
33 Union Avenue
Bridgeport, Conn., U. S. A.

(Formerly Grand Rapids, Mich.)

Catalogue No. 113 gives full information

Improved Motor Boat Closet

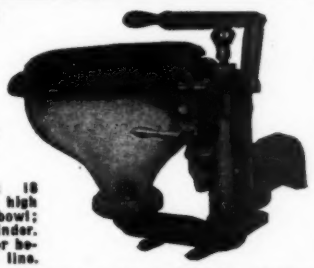


Figure 1404

Dimensions: 18 x 18 x 11" high to top of bowl; 3½" cylinder. For above or below water line.

The best little closet on the market today, possessing many of the advantages of the large size toilet. All brass and porcelain. Oak seat and cover.

All prices subject to market advances, which are continually changing.

THE J. H. CURTISS CO.

The J. H. Curtiss Co.

Pioneer Specialists in Marine Sanitary Fixtures

Since our advertisement appeared in the first issue of MoToR BoatinG, December, 1907, hundreds of Curtiss fixtures have been installed in motor cruisers and yachts of all sizes, including some of the finest boats launched within this period.

The Curtiss line is exceptionally complete, varied in type, size and price to meet every possible requirement. Each model has been designed in accordance with our wide experience in boat work and can be depended upon in quality, service and durability no matter whether it is our highest or lowest priced model.

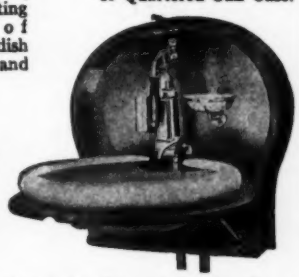
"PRICES ON APPLICATION"

With Pump

Cock on pump swings upward, thus preventing breaking of bowl. Soap-dish is porcelain and removable.

No. 5
Height, 19 in.
Width, 19 in.
Depth Closed, 6 inches.
Quartered Oak Case, or Mahogany Case.

Lining and Fixtures Nickel-plated. Porcelain Bowl. Mahogany or Quartered Oak Case.



2 South Street, New York

ESSENTIALLY a quality product, furnishes its user with an ideal socket wrench — one that will get into the most difficult corners and with its great strength and flexibility yank loose the most stubborn bolt or nut on any boat.

Let us send you data on our special Dealers' proposition. Fully guaranteed.

ROBINSON EQUIPMENT CO.
Waltham, Mass.

BET-R-BILT SOCKET WRENCH

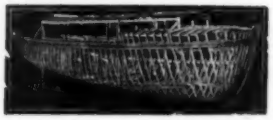
Albany BOATS

Express Cruisers de Luxe
Mahogany Fast Runabouts

Early delivery can be arranged on a few desirable boats.

Albany Boat Corporation
7th Street Watervliet, N. Y.

Build Your Own Boat



—cruiser, work boat, open launch or row-boat — from our knock-down frames or patterns.

Save ½ to ¾ the Cost.

Send for Catalog and Tell Us Your Requirements.

DEFOE BOAT & MOTOR WORKS
3220 State Street Bay City, Mich.

ONE WAY ONLY—THE BEST WAY—BUY!

We Sell Our Sets

Wireless for Ship *and* Land Stations

CUTTING & WASHINGTON RADIO CORPORATION
GENERAL OFFICES
6 and 8 West 48th Street, New York, N. Y.

You Can Build Your Own Boat

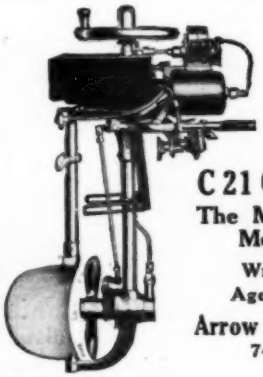
and save 2/3 the cost
By the BROOKS K. D. SYSTEM

Brooks Boats are handsome, seaworthy, up-to-date in design and easy to build. We also build complete boats.

The Brooks Guarantee: Your Money Back if You Are Not Satisfied

Send 10c for 64-page catalogue showing all models.

BROOKS MFG. CO., 1101 Rust Ave., Saginaw, Mich.



Waterman Motors

LIGHT WEIGHT LONG LIFE

C 21 OUTBOARD MOTOR

The Most Powerful Outboard Motor on the Market

Write For Free Catalogue
Agents Wanted Everywhere

Arrow Motor and Machine Co.
740 Frelinghuysen Ave.
NEWARK, N. J.

"LIBERTY KID"

The Best Little Medium-Duty Marine Engine on the Market

High grade four cycle design, valve-in-head, removable cylinder head, bronze rocker arms, push-rods, plunger pump, etc. Over 200 in actual use.

Immediate deliveries on early orders. Write for catalog and testimonials.

AGENTS AND DEALERS WANTED

A. G. HEBGEN
Manufacturer and Sole Distributor
440 Market St., San Francisco, Cal.

3½-4 H.P. 600 to 750 R. P. M.

Also built in "Liberty Twin" Double Cylinder Model giving 8-10 H.P., for gasoline or kerosene

STRATFORD OAKUM
—AND—
CAULKING COTTON

meet all U. S. Government specifications and receive the highest classifications of American Bureau of Shipping and Lloyds Register of Shipping.

YACHT DEPARTMENT
George Stratford Oakum Co., Jersey City, N. J.

Advertising Index will be found on page 126

MARINE ELECTRICAL EQUIPMENTS

SHIPS TELEGRAPHS

SINCE 1845 WE HAVE BEEN DESIGNERS AND MANUFACTURERS OF COMMUNICATING AND SIGNALLING SYSTEMS FOR NAVAL AND MERCHANT VESSELS.

CORY ELECTRICAL AND MECHANICAL TELEGRAPHS AND LIGHTING EQUIPMENTS ARE THE RECOGNIZED STANDARDS.

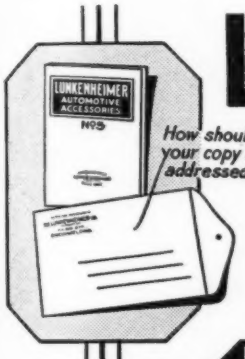
CHAS. CORY & SON, Inc.

NEW YORK
183-187 Varick Street
Main Office and Factory

PHILADELPHIA
207 Market Street

SEATTLE
515 Hage Bldg.

SAN FRANCISCO
11 Mission Street



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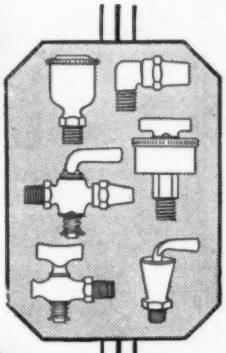
LUNKENHEIMER
Automotive Accessories

GROUND KEY COCKS, NEEDLE & CHECK VALVES, GASOLINE STRAINERS AND PRIMING CUPS

THE LUNKENHEIMER CO.
"QUALITY"
LARGEST MANUFACTURERS OF HIGH GRADE ENGINEERING SPECIALTIES IN THE WORLD
NEW YORK CHICAGO CINCINNATI BOSTON LONDON
Write for Catalog No. 5-CC

LUBRICATORS, SIGHT-FEEDS, OIL AND GREASE CUPS, TUBING UNIONS, FITTINGS ETC.



RELIABILITY-ECONOMY-SERVICE

29-38-33

MIANUS
MARINE MOTORS

THE FIRST REALLY SUCCESSFUL HEAVY OIL ENGINE

Consider this Power Plant for Your Boat

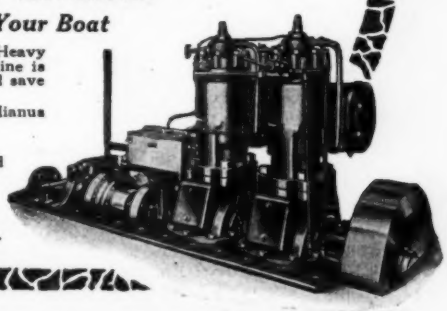
For your cruiser, auxiliary or commercial boat, the Mianus Improved Diesel Heavy Oil Engine (Leissner System) has no equal for service and economy. Gasoline is high in cost. Heavy oil is cheap and plentiful. A year or two of operation will save you the cost of your engine in fuel.

More simple than the gas engine—more economical than the Diesel. The Mianus Heavy Oil Engine demands your attention.

Five sizes up to 60 H.P.

The famous Mianus two cycle and four cycle engines are also manufactured by us.

Your copy of our catalog is waiting for you. Write for it.



The Mianus Motor Works, Stamford, Conn., U. S. A.

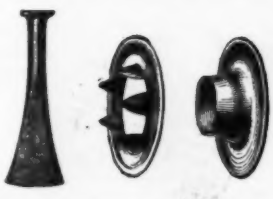
New York, N. Y. Baltimore, Md. Norfolk, Va. Boston, Mass.
Portland, Maine Eastport, Maine St. John, N. B.

MARINE SUPPLIES IN BOSTON

WRITE US FOR QUOTATIONS

or call at our store if you are in Boston. We carry the most complete stock of marine hardware, motor boat supplies, accessories and specialties anywhere in this vicinity.

Honest prices, prompt delivery and careful service to mail or local orders, in retail or wholesale quantities. No catalog on account of current price changes.



Boston Marine Hardware Co.
259 Atlantic Ave. Boston, Mass.

Run Your Boat on Kerosene

Cheaper than gasoline and equally good when used with the

OLSEN KEROSENE VAPORIZER

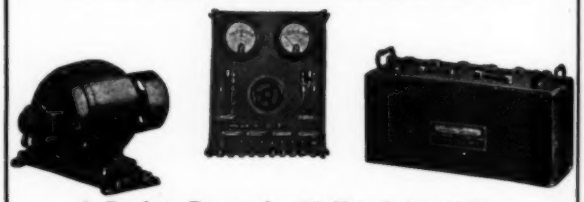
Sold on 30-Day Money-Back Guarantee

Fits any 1" to 3" carburetor. Perfect combustion—no waste, smoke, or smell. Greater flexibility and mileage — less carbon. Fuel costs greatly reduced. Send for details.

U. S. VAPORIZER COMPANY

214 STATE STREET BOSTON, MASS.

"DAYTON" LIGHTING AND IGNITION SYSTEMS. 6, 12, 32 VOLTS COMPLETE



A Product Proven by 20 Years' Actual Use.
Complete Catalogue Upon Request.
THE A-C ELEC. MFG. CO., DAYTON, OHIO

SEABRIGHT DORY CRUISERS

The most seaworthy motor cruisers of their size ever built. If you want real pleasure at the lowest cost and with the utmost safety you should own one of these famous Seabright boats. We also build Work Boats, Ship Tenders, Life Boats, Surf Boats, etc.

Write today for prices

THE BANFIELD BOAT AND LAUNCH WORKS

Office and Works:

Atlantic Highlands New Jersey, U. S. A.

MAYNARD-ADAMS ENGINE CO.

Eighth and Delaware Streets
Berkeley, California

A high grade 3½ H.P. 4-cycle power plant. Ford replacements.

Eastern Agent
H. A. Westerman, Riverhead, N. Y.
Menge Marine Hardware & Supply Co., New Orleans.
Other agents wanted.

Burns Kerosene or Gasoline

$141 to $266

HESS MONO-MARINE

A High Grade Single Cylinder Four Cycle Engine of 4-5 H.P.

The ideal engine for your tender, fishing boat or other craft up to 30 ft., and on larger boats for operating generators for lighting plant or wireless outfit.

Many parts interchangeable with standard Ford engine parts, carried in stock by dealers the world over. This includes timing gears, valves, valve springs, connecting rod, piston, etc. Dual ignition.

Furnished complete with Hot-Spot Manifold, High Tension Magneto, Carburetor, Timer, Spark Coil and Switch.

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We have an excellent money making proposition for agents and dealers

HESS MOTOR COMPANY

1430 Sherman Street Detroit, Michigan

Exclusive Export Sales Dept., W. D. Blood & Co., 44 Whitehall St., New York, N. Y.

Built by LUDERS

The Last Word in Yacht Designing and Building

Luders Marine Construction Company

Stamford, Conn.

The Compass For Your Boat

should be the best obtainable. For seventy years Ritchie compasses have been the choice of experienced navigators.

Select the Ritchie for your boat.

Our catalog will show you the one best suited for your needs. Send for a copy today.

E. S. RITCHIE & SONS
Established 1850
110 Cypress Street
Brookline, Mass.

The Motor of No Drawbacks

GIERHOLTT

Gearless Drive Outboard Motors
Marine City, Mich.

Solves:
The Starting Problem
The Weed Problem
The Shallow Water Problem

GEARLESS DRIVE

In carrying or in stalling position heaviest part weighs 40 lbs. All parts accessible. Carries like a hand bag. Detachable propeller shaft. Removable gas tank. Convertible to inboard. Write for particulars.

AGENTS WANTED

Advertising Index will be found on page 126

Yacht Construction — *Repairs, Outfitting, Storage*

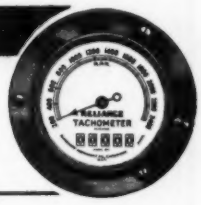
PORT JEFFERSON MARINE RAILWAY CO.
PORT JEFFERSON, N. Y.

Large Railway 1000 tons cap'y, 15 feet draft.
Small Railway 300 tons cap'y, 10 feet draft.

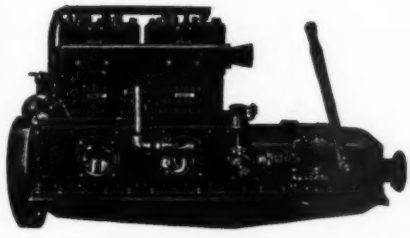
Gasoline, water, yacht supplies — *Excellent harbor, all facilities*

RELIANCE TACHOMETERS

Various models to indicate speed from 50 to 3600 R.P.M.
Counter to record total revolutions for any desired period.
Your motor boat equipment is not complete without one.
Write for Bulletin
Blanchard Instrument Company, Cambridge 39, Mass.



GRAY-PRIOR
FOUR CYCLE MARINE MOTORS
Built up to a Standard—not down to a price

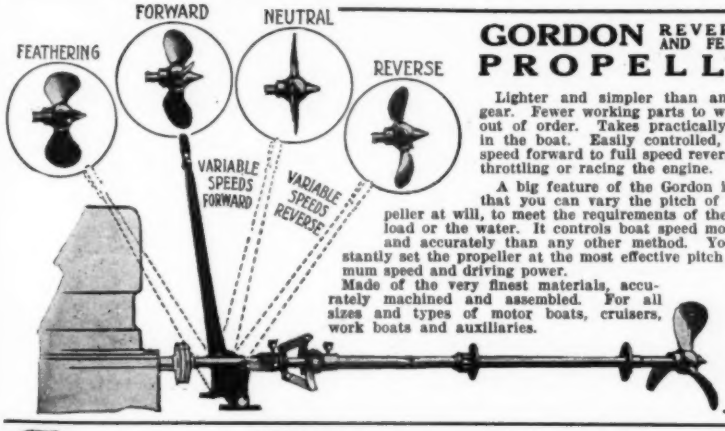


A Clean-Cut Power Plant
For Commercial Boats and Cruisers

Model D-4, Medium Heavy Duty
36 Horse Power Bore, 4½ inches Stroke, 5 inches

Write today for full description and prices

THE GRAY & PRIOR MACHINE COMPANY
56 Suffield Street Hartford, Conn., U. S. A.

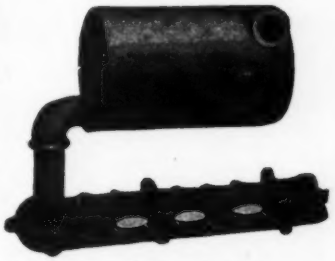


GORDON REVERSIBLE AND FEATHERING **PROPELLER**

Lighter and simpler than any reverse gear. Fewer working parts to wear or get out of order. Takes practically no room in the boat. Easily controlled, from full speed forward to full speed reverse without throttling or racing the engine.

A big feature of the Gordon is the fact that you can vary the pitch of your propeller at will, to meet the requirements of the boat, the load or the water. It controls boat speed more quickly and accurately than any other method. You can instantly set the propeller at the most effective pitch for maximum speed and driving power.

Made of the very finest materials, accurately machined and assembled. For all sizes and types of motor boats, cruisers, work boats and auxiliaries.



Write today for catalog and prices.
SILENCER and UNDERWATER EXHAUST
Complete Outfit, $12.00 F. O. B. Cleveland
THE GORDON PROPELLER & MFG. CO.
9001 Desmond Ave. Cleveland, Ohio, U. S. A.

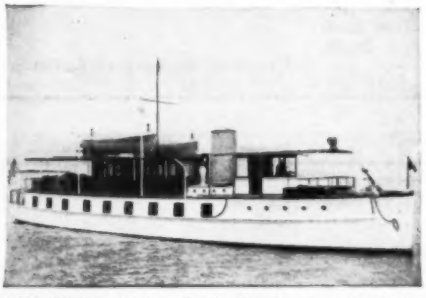
FINISHED CRANK SHAFTS

P. H. Gill & Sons Forge and Machine Works, Brooklyn, N. Y.

We are furnishing them to some of the leading marine engine builders. Carbon and Alloy Steel, Heat Treated to your own specifications. We grind all Pins and Bearings. Forged, machined, and finished complete in our own plant. Let us quote you.

DECK CANVAS—ALL WIDTHS
YACHT SAILS—AWNINGS—SPRAY HOODS—Etc.
522 So. Delaware Ave Philadelphia
GEO. R. BURROWS, Inc.
2 South St New York

THEIRS ARE MATHIS-BUILT



LUNETA Mathis Built Houseboat enjoyed by Col. S. L. H. Slocum, Washington, D. C.

Judgment makes leaders of men.
You cannot question the quality of that judgment even when directed far afield from the particular calling that largely developed it.

Choosing a houseboat calls for keen selection—a close consideration of the vital factors of service, comfort and economy of operation. And the universally acknowledged leaders on all these scores are

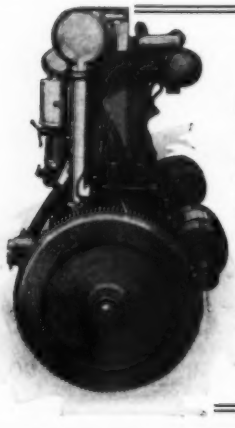
MATHIS-BUILT HOUSEBOATS

The best substantiation of that statement is the fact that men who really do know, who always judge every vital factor before they purchase, have selected houseboats of our making—MEN LIKE

E. H. GARCIN
E. L. KING
R. M. BOND
J. H. CARSTAIRS
MURRAY GUGGENHEIM
L. H. & A. W. ARMOUR
H. N. BARUCH
HENRY W. SAVAGE
JAMES DEERING
ARTHUR CURTIS JAMES
W. J. MATHESON
COL. S. L. H. SLOCUM

and many others of equal prominence

MATHIS YACHT BUILDING COMPANY
Specialists in Houseboats and Cruisers from 40 to 120 Feet
Cooper's Point, Camden, N. J.



Peerless

New High Speed—Light Weight

The product of experience and development in actual boat service. Extremely light weight is secured by employing special castings and alloy steels throughout.

Bore 5". Stroke 7". Speed 1650 R.P.M.

4 cyl. 125 H.P.....700 lbs.
8 cyl. 250 H.P.....900 lbs.
12 cyl. 400 H.P.....1100 lbs.

Peerless Marine Motor Co.
2160 Niagara St. Buffalo, N. Y.

Money Made is Money Saved

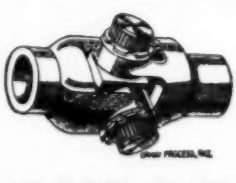
E. J. WILLIS CO. 85 Chambers St., New York

ANNOUNCEMENT

We are pleased to announce that the Gilbert Special 18 Ft. by 4 Ft. 4-inch beam Motor Boat is now being manufactured in quantities as a stock proposition, by the Dawn Boat and Shipbuilding Corporation, Clason Point, New York City. Except the Stem and Ribs of White Oak, this beautiful boat is constructed entirely of Mahogany, natural finish throughout above the waterline. Send for catalogue and price list.

Dawn Boat & Shipbuilding Corp.
Clason Point, New York City.

MARINE JOINTS



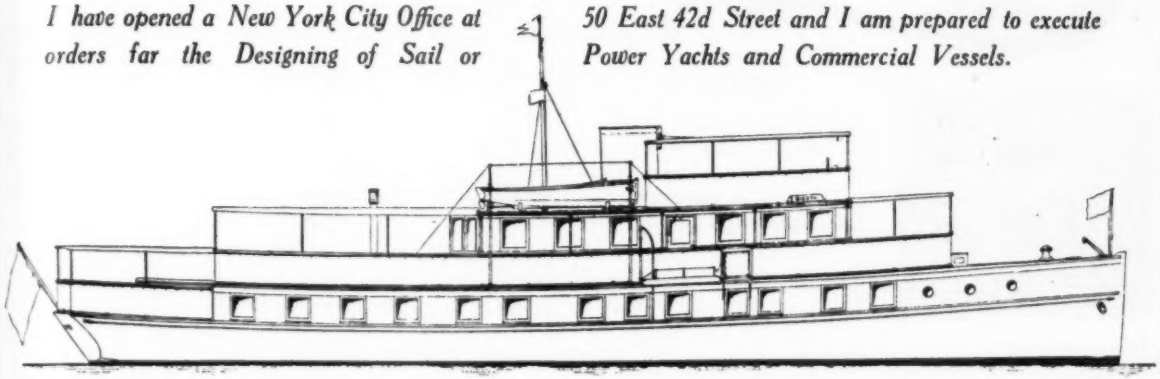
That Transmit Full Power at Full Speed. Have been giving satisfaction for sixteen years.

BLOOD-BROS. MACHINE CO.
Pioneer Builders of Universal Joints
ALLEGAN MICHIGAN

Advertising Index will be found on page 126

Announcement

I have opened a New York City Office at 50 East 42d Street and I am prepared to execute orders far the Designing of Sail or Power Yachts and Commercial Vessels.



I have made a specialty of **Power Houseboats**

and have accumulated some very interesting data on costs, speed and equipment of modern seagoing types.

A Brokerage Department for Buying, Selling or Chartering Yachts is at your disposal.

I would appreciate the privilege of adding your yacht to the list.

R. M. HADDOCK, *Naval Architect and Yacht Broker*
50 EAST 42d STREET, NEW YORK CITY

DE LUXE
LIGHT WEIGHT CAST IRON PISTON
"The Successful Light Weight Piston" ©

A SET of DE LUXE Light Weight Pistons will work a miracle in making your motor smooth running, and in increasing its power and speed. They give all the advantages of aluminum alloy pistons, with none of their disadvantages.

DE LUXE Pistons are 40% to 50% lighter than stock factory cast iron pistons and within a few ounces of aluminum pistons. Their light weight eliminates motor vibration, is easier on the bearings and actually saves both gasoline and oil.

These are the strongest light weight pistons ever designed. The patented inside reinforcing ribs distribute the strength correctly, keep the piston absolutely round under the hardest pounding and add considerably to the radiating surface which keeps the piston cool.

DE LUXE Pistons can be fit much closer in the cylinder, which prevents piston slaps, keeps oil out of the combustion chamber and keeps unburned gasoline out of the crankcase. Being made of cast iron they have the same low expansion as the cylinders. The biggest improvement you can make in the performance of your motor is secured by installing a set of DE LUXE Pistons.

DE LUXE
LIGHT WEIGHT CAST IRON PISTON
"The Successful Light Weight Piston" ©
PATENTED U.S.A.
FOREIGN PATENTS PENDING
LOOK INSIDE YOU CAN'T GO WRONG
VERY LIGHT AND VERY STRONG

DE LUXE Pistons are carried in stock by all branches of L. Lawrence & Company

L. LAWRENCE & CO. **Established 1862** **292 Halsey Street, Newark, N. J.**

Owners of the Lawrence Patent Process for repairing scored cylinders without regrinding. Scores are filled with silver nickel alloy, refinished like new and work is guaranteed for the life of the motor. Write today for quotations if you have a scored cylinder or cracked water jacket.

TRADE LAWRENCE MARK

LAWRENCE SERVICE PLANTS

Buffalo—10 Summer St.
Chicago—1522 Michigan Ave.
Cleveland—6529 Euclid Ave.
Detroit—83 Moldrum Ave.
Los Angeles—1030 S. Grand Ave.
Milwaukee—18 Martin St.
Minneapolis—14 N. 9th St.
Newark—292 Halsey Street
New York—355 W. 57th St.
Philadelphia—1601 Summer St.
Pittsburgh—5102 Baum Blvd.
San Francisco—116 Hyde St.

LICENSEES NEARLY EVERYWHERE

A few good territories for licensees still open.
A few good territories for licensees still open. Inquire at our License and Home Office, 292 Halsey St., Newark, N. J.
Infringers will be prosecuted to the full extent of the law.

"The Capitol"

A Marine Unit Power Plant

For Speed Runabouts and High Class Cruisers

Dash instrument and switch plate controlling ignition, lights, ammeter, oil gauge and dash lights

COMPLETELY ENCLOSED—COMPLETELY EQUIPPED

FROM the first glance the Capitol inspires the confidence of marine engine buyers. Its clean cut, well proportioned exterior with every moving part enclosed and every accessory built in immediately suggests the fact that it is the product of master designers. There isn't a smoother, quieter running marine engine. Vibration and noise are eliminated by perfect balance of moving parts, wide-faced helical-cut timing gears, force feed lubrication, ball bearing universal joint, three point suspension, and many other improvements over ordinary construction.

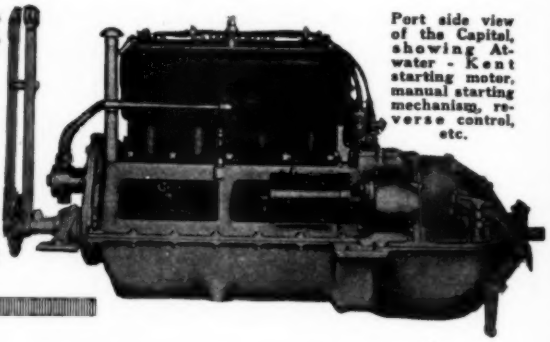
Highest Grade Equipment

Delco ignition, Atwater-Kent two-unit starting, lighting and generating system, Willard storage battery, Stromberg or Schebler carburetor, instrument plate shown above and all other necessary equipments are included.

If you own or are planning the kind of a runabout or cruiser that deserves a really excellent power plant, you should know more about the Capitol, its special features of construction and how it is built.

Bore 4¼"	Stroke 5½"
High Speed Model	60-65 H. P. at 2000 R. P. M.
Medium Speed Model	30-34 H. P. at 1000 R. P. M.

Write today for complete description and prices



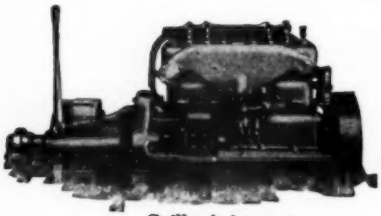
Port side view of the Capitol, showing Atwater-Kent starting motor, manual starting mechanism, reverse control, etc.

Auto Engine Works, St. Paul, Minn., U.S.A.

Eastern Representatives: Ventnor Boat Works, Atlantic City, N. J.; Fred C. Duclon, Alexandria Bay, Jefferson Co., N. Y.; Gray-Aldrich Company, Inc., 84 Atlantic Ave., Boston, Mass. Canada: The A. R. Williams Machinery Company, Limited, 64-66 Front St. W., Toronto, Ont.

G.H.MASTEN CO., Inc.

5 SPEED MOTOR



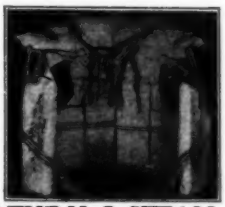
Caille Aristocrat

NEW YORK DISTRIBUTORS OF CAILLE MOTORS AND REGAL GASOLINE ENGINES

Masten
TRADE MARK

PATENT REVERSIBLE LIFE PRESERVER

For SAFETY from patent infringement buy from the patentee. Economical in price.



ADOPTED BY THE U. S. STEAMBOAT INSPECTION SERVICE.

MANUFACTURERS OF
Motor Boat Tops, Spray Hoods,
Life Rafts, Life Preserver
Cushions, Swimming Belts,
Cabin Upholstery and Draperies.

BUILDERS OF
Rowboats, Motorboats,
Runabouts, Cruisers.

Write for catalog

Swim with the "Liberty" Swimming Belt.

Your Dealer Will Supply You. Or $2.00 By Mail.

G. H. MASTEN COMPANY, Inc.
38 EAST 9TH ST., N. Y.

Advertising Index will be found on page 126

Do You Want Safety on Your Boat?

Tip It Over, It's Safe!

In the roughest sea or stiffest wind, the new Sterno Stove burns with **absolute safety** and dependability. The fuel cannot spill. Can you say the same of any other boat stove?

Sterno Stove is ruggedly constructed of **galvanized steel** and guaranteed rust proof.

Burns Sterno Canned Heat, the solid non-spillable fuel, in the new, large economy cans.

Just what you want for the Yacht or Motor Boat.

Write now for particulars and prices.

STERNO CORPORATION
9 East 37th Street New York

Read What The Insurance Company Says:

Chubb & Son
Managers

Federal Insurance Company
5 and 7 South William Street
New York

In Reply Please Refer to NC

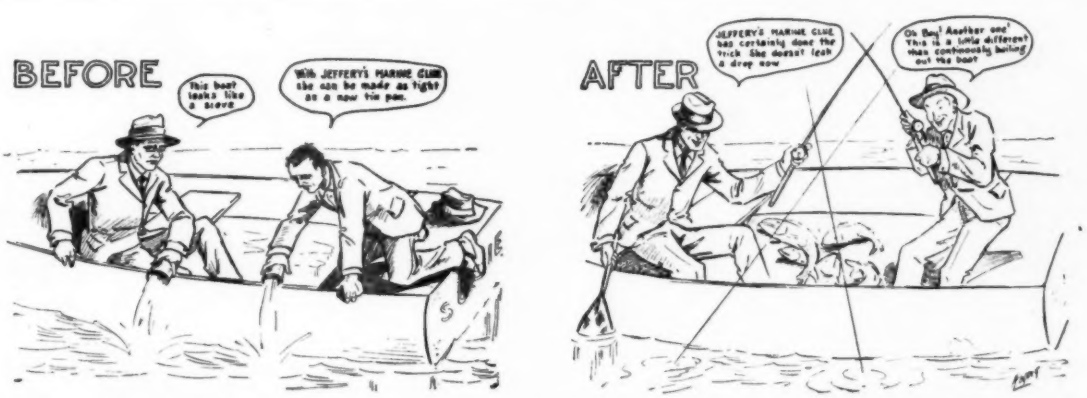
February 21, 1921

* * * * * *

We are very glad to advise you that in our opinion the Sterno stove, as exhibited to our surveyor, is very satisfactory for its purpose and reduces the risk of fire to a minimum.

Yours very truly,

GT MF


BEFORE
This boat leaks like a sieve
With JEFFERY'S MARINE GLUE the can be made as tight as a new tin pan.
AFTER
JEFFERY'S MARINE GLUE has certainly done the trick She doesn't leak a drop now
Oh Boy! Another one! This is a little different when continually bailing out the boat

Does Your Boat Leak? Send for our Booklets *"How to Make Your Boat Leakproof"* and *"Marine Glue—What to Use and How to Use It."*

Each grade is for a different purpose. IT IS IMPORTANT THAT YOU USE THE GRADE WE RECOMMEND.

Any old boat, so long as the frames are in fair condition, can be made watertight by following the instructions, in the above booklets. This applies to anything that floats from a canoe to a yacht, wood or steel.

Put your leak troubles up to us—we will help you to stop them.

For more than 75 years Jeffery's Marine Glue has been the choice of the foremost boat builders of the world.

Jeffery's is a product that has not varied from the strict line of quality—it is not a competitive commodity made to meet a price.

JEFFERY'S WATERPROOF MARINE GLUE

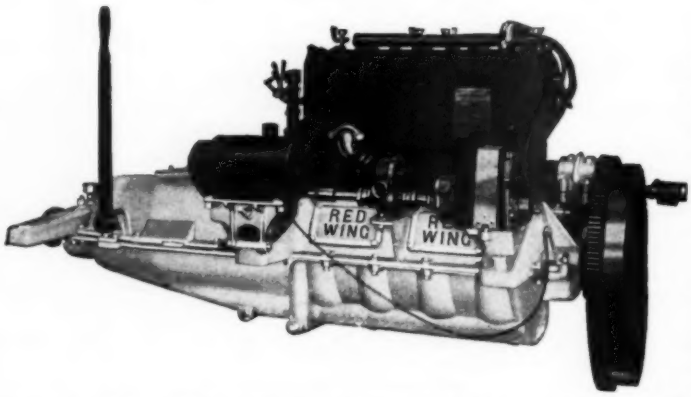
IN ALL THE VARIOUS GRADES

For sale by all Yacht, Boat and Canoe Supply Houses, Hardware, Paint and Oil and Sporting Goods Dealers

L. W. FERDINAND & CO., 152 Kneeland St., Boston, 11, Mass.

Red Wing Thorobred
THE MOTOR WITH POWER TO SPARE

SPRING IS NEAR



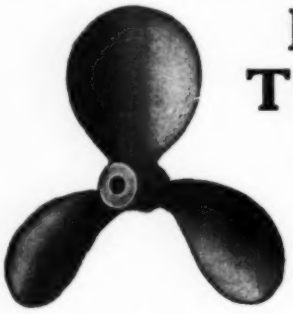
If you're considering a new motor act now. Later immediate shipment may not be as easy and you may have to wait just when you want your motor.

The "THOROBRED," recommended by all first class boat builders, and used by thousands in all manner of service all over the world, is a real investment. Use it for years and it will bring nearly as much, if you want to sell it, as you paid for it. That's the kind of a motor to buy. All you get out of it is merely interest.

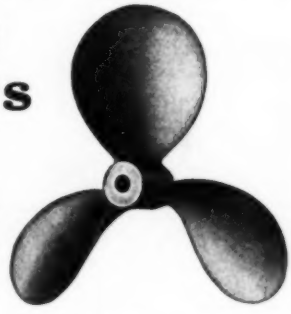
One of our five sizes, 10 to 40 H.P. will exactly meet your requirements. They burn either kerosene or gasoline. Write us today for prices and details.

RED WING MOTOR COMPANY

Department B Red Wing, Minnesota U. S. A.



Hyde Turbine Type Propellers



are stocked in every locality. The following is a partial list of firms carrying Hyde wheels. Consult your nearest dealer for information and prompt, courteous service.

PORTLAND, MAINE
Chas. F. Guptill Co.,
175 Commercial Street

NEW BEDFORD, MASS.
Hathaway Machinery Co.,
North Water & Elm Streets

PHILADELPHIA, PA.
Elisha Webb & Son Company,
136 South Front Street

CRISFIELD, MARYLAND
Clarence Sterling & Son,
1104 Main Street

SAVANNAH, GEORGIA
White Hardware Company,
25 Congress Street, West

NEW ORLEANS, LOUISIANA
Stauffer, Eshleman & Company,
511 Canal Street

WILMINGTON, CALIFORNIA
Fellows & Stewart

PORTLAND, OREGON
Oregon Marine & Fisheries Supply Co., 105 First Street

DETROIT, MICHIGAN
Belle Isle Boat & Engine Company,
East Jefferson & Parkview

CHICAGO, ILLINOIS
W. L. Masters & Company,
229 North State Street

BOSTON, MASS.
Rapp-Huckins Company,
59 Haverhill Street

NEW YORK CITY
W. C. Disbrow, Jr.,
8 Reade Street

BALTIMORE, MARYLAND
Unger & Mahon, Inc.,
Pratt & Gay Streets

NORFOLK, VIRGINIA
Gas Engine & Boat Corporation,
First Street near Front

MOBILE, ALABAMA
Marine Supply Company

HOUSTON, TEXAS
C. L. Bering Company,
1009 Capitol Avenue

SAN FRANCISCO, CAL.
Johnson, Joseph & G. M. Josselyn & Co., 56 Sacramento Street

SEATTLE, WASHINGTON
Pacific Net & Twine Company
1213 Western Avenue

ALEXANDRIA BAY, NEW YORK
Hutchinson Bros.

MILWAUKEE, WISCONSIN
Joys Bros. Company,
201 East Water Street

Write for our booklet "Propeller Efficiency." It contains valuable information. A copy will be mailed on request.

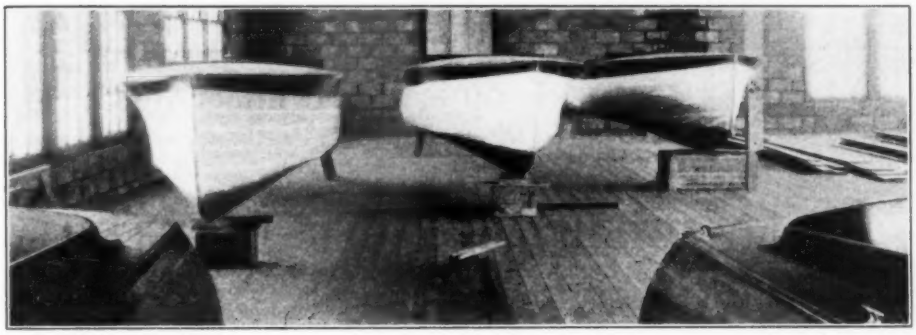
HYDE WINDLASS COMPANY **Bath, Maine**

Advertising Index will be found on page 126

Hacker Runabouts Getting the Finishing Touches

This picture shows a corner of the big Hacker boat plant at Mt. Clemens, Mich., devoted entirely to producing the famous 21 foot Hacker runabouts. Here are some of the boats getting the finishing touches in paint and varnish.

Quantity production makes it possible to sell this boat for less than half of what it would cost under the one-at-a-time method of building. The beam is 5′ 8″ and draft only 16″ yet the high freeboard and V bottom design makes it very dry and seaworthy. The engine is a 20 H.P. Kermath, electric starting and lighting, giving a speed of 20 miles.



Price only

$1975

Plus tax
F. O. B.
Mt. Clemens

Designed and Built by John Hacker, N. A.

Order early

CENTRAL MARINE SERVICE CORP.
709 VINTON BUILDING **DETROIT, MICH.**

NIAGARA MOTORS

Put "The Power of Niagara" in Your Boat

The Niagara is a genuinely high-grade motor, built with all the individual attention, rigid inspection and careful testing that the buyer of a high-grade engine has a right to expect. The materials and workmanship are the best that money can buy. The design has been developed during our seventeen years' experience, improvements always keeping pace with the progress of marine engineering practice.

The superior quality of Niagara design is shown by such features as separate T-head cylinders, two main bearings for every crank-throw, long light-weight pistons, carefully ground, accurately balanced and fitted with four rings each, large handhole plates, built-in reverse gears, two complete systems of ignition, etc., etc.

Niagara Motors are being successfully used in every type of boat—runabouts, speed boats, hydroplanes, cruisers, passenger boats, work boats, etc. Medium duty and high speed 12 H. P. to 160 H. P.

Two cylinders and four cylinders, 4¾ x 5½″. Four, six and eight cylinders, 6¼x7″

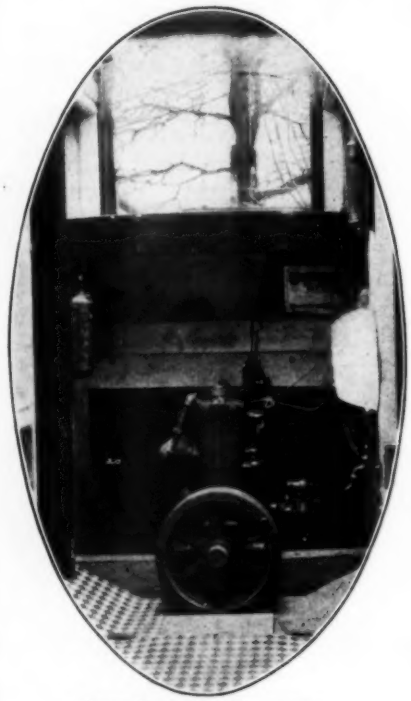
Write today for catalog and name of nearest dealer

NIAGARA MOTORS CORPORATION
DUNKIRK, N. Y.

THE PARR-LOICHOT ENGINE CORP., General Distributors, 380 Canal Street, New York, N. Y.

A PALMER IS THE MOTOR

which will help the Hippocampus on her 7000 mile trip



Power Plant of the Hippocampus

Follow the Palmer on her trip to San Francisco, California.

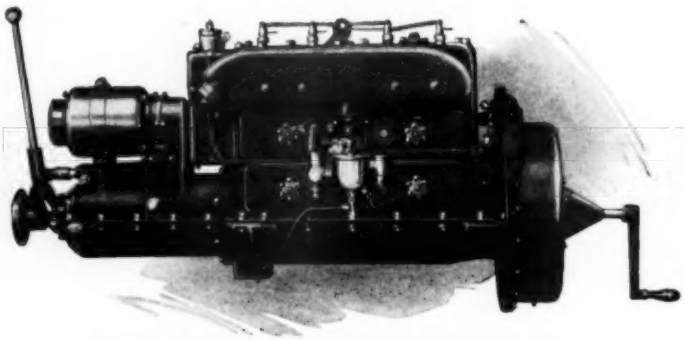
There is one for every purpose. From 2 1-2 h. p. model A-1, 2 cycle up to a six cylinder 75-85 h. p. 4 cycle.

PALMER BROTHERS ENGINES, Inc.
COS COB, CONN.

Branches and Distributers

New York Norfolk Seattle Vancouver
Philadelphia Baltimore Portland, Me.

Also four sizes of two cycle engines for inboard installation. Sizes 2½ to 8 H. P.



Satisfaction guaranteed or your money back. Send for catalog and trial proposition.

Model 44, 14-20 H. P. 4 cyl. 4 cycle. Showing both electric and hand starter.

Attachable Motor for Row Boats

If you are equipping a boat of 35 feet or under, we make an engine that will handle it properly. We make no pretentions at building racing engines, but confine our efforts to producing the type of engine required for family launch;—engines that carry the refinement such machines should have to give their owners the reliable, smooth running qualities so essential to the pleasant hours of recreation they expect.

The small details so often neglected, are the ones that make or mar the pleasure of ownership. These details are given particular stress in the L—A design and execution.

The model 44 shown, has one small revolving part in sight—the shaft driving the magneto. The attachable engine has no moving part exposed save the magneto flywheel. No soiled hands, no flying grease.

(84)

LOCKWOOD-ASH MOTOR CO., 2107 Jackson St., Jackson, Mich.

LOCKWOOD-ASH
MARINE LA ENGINES

Advertising Index will be found on page 126

Everybody's Sensible Cruiser

is the

RED BANK YACHT WORKS

version of the requirements of the average motor boat enthusiast for a comfortable, dependable, safe and sane cruiser.

It is a development of the famous Sea-Bright Skiff model as used by the seafaring folk off the North Jersey Coast for years. The "Lap-Strake" construction of planking insures great strength, stiffness and seaworthiness. This construction obviates the necessity of a marine railway in hauling out. Unusual cabin room is due to the absence of power plant, which is located under flush hatches in the flooring of the cockpit.

This is a stock cruiser equipped with a Model "B" 40 HP. Red Wing motor complete with electric starter. Illustrated pamphlet sent on request.

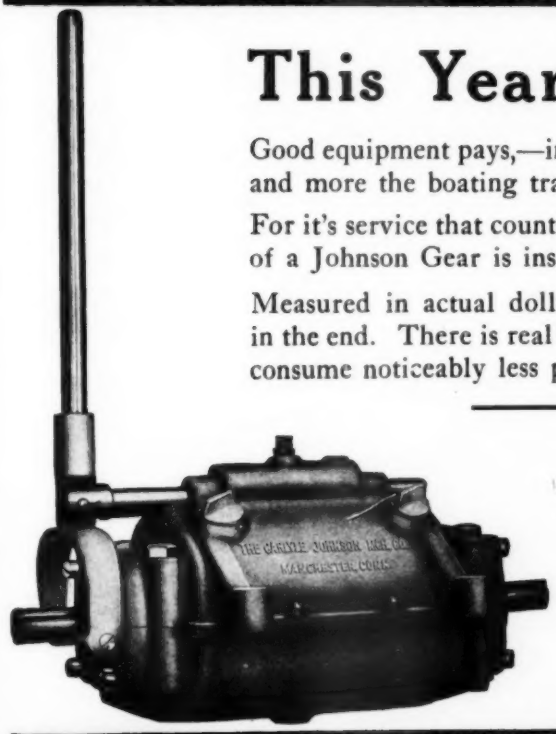
We carry in stock Fast Runabout 25 ft. and 32 ft. length. Speed guaranteed in accordance with power installed. Let us figure on your requirements for this summer. We build up to 100 ft. and 5 ft. draft, any type.

RED BANK YACHT WORKS

SHREWSBURY RIVER, RED BANK, N. J.

Two Power railways—complete shops
Phone Red Bank 840

THE JOHNSON MARINE REVERSE GEAR



This Year—Buy the Best

Good equipment pays,—in time, in money, and in satisfaction. More and more the boating trade is looking for *value* rather than price.

For it's service that counts. And when service is considered, the cost of a Johnson Gear is insignificant.

Measured in actual dollars and cents, Johnson Gears save money in the end. There is real satisfaction in their smooth operation; they consume noticeably less power; but, *above all—they wear.*

The Four Big Features:

Johnson Friction Clutches.
Alloy Steel Gears and Shafts.
Ball Bearings throughout.
Completely enclosed.

Write Department 25 for our Catalog.

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN

"Those who go to sea must be able to see."

Comet Marine Generators

A NEW LIGHTING UNIT

for the open motor boat or any installation where it is not convenient to install a regular switchboard.

MS Control on T-65 Generator

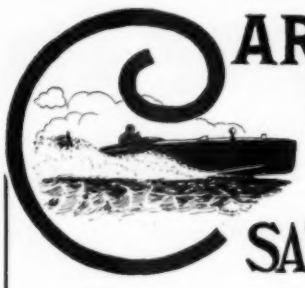
Comet Generators with MS CONTROL combine in one unit generator, reverse current relay, switch and fuse.

MS Control may be mounted on any size Comet Marine Generator. Easy to install, simple and efficient.

Send for Bulletin No. 5.

COMET ELECTRIC CO.

1241 St. Paul St. Indianapolis, Ind.



CARPENTER SUPPLIES GIVE SATISFACTION

THE purchase of Carpenter Equipment for your spring outfit is an investment which yields dividends of safety, comfort, and enjoyment.

These dividends are returned to you every time you use your boat.

The reason—we have had eighty years' experience in outfitting boats and in selling

MARINE SUPPLIES

This experience is at your service.

PRICES REDUCED

Our revised Catalog number 103A with discount sheet showing price reduction is now ready for distribution. Forwarded on application.

AND GUARANTEED

Do not put off ordering for further reductions which are unlikely. We will GUARANTEE PRICES against market decline until June 15th on all goods ordered now.

GEO·B·CARPENTER & CO.

200 W. Austin Ave. Chicago

How To Build Dolphin

(*Continued from page 30*)

ened to hatch. Brass strip shall overlap seam when hatch is closed.

Companionway: Doors to be ¾-inch mahogany or oak hung on two bronze fast pin butts and fitted with bronze mortise ship's lock set with two knobs and provided with duplicate keys. Slide to be ¾-inch oak or mahogany, rails or runs to be 1⅛-inch oak or mahogany with groove for ends of slide framing to slide in. Sill to be one-inch oak or mahogany, jambs to be same.

Aft Deck: To have 1⅛ x 2-inch oak beams and ¾-inch white pine deck, seams caulked and filled with black marine glue.

Ceiling: Cockpit ceiling to be ⅜ x 2-inch tongued, grooved and V-d cypress or mahogany, oak or butternut fastened with brads or escutcheon pins. To be set into rabbeted sill on floor. Cabin ceiling to be same material.

Cockpit Seat: To be framed out with 1⅛ x 2 inches oak, seat top arranged to extend to form berth. Finish piece ⅜ x 3 inches secured to sliding members of seat. Top to be ⅞-inch pine. Front staving to be ⅜ x 2-inch tongued, grooved and V-d cypress or mahogany.

Cabin Floor: To be laid on top of floor timbers. To be ⅞-inch pine. Boards in center for a width of at least 12 inches to be portable. All ends of boards to rest on floor timber.

Port Lights: Hinged bronze ports of 6 and 7-inch diameter, to be fitted over rubber gasket and brass screw fastened by brass screws.

Bitts: On forward and aft decks galvanized butt 10 inches high and 7 inches high respectively, to be securely bolted through oak filler blocks.

Rail Cap: Aft of raised deck planking and frames are to be carried up to form sides of cockpit. A clamp to suit work to be fastened to upper end of frames. Rail cap of oak or mahogany, 1 x 4 inches, to be fastened by brass screws, heads countersunk and plugged.

Engine Bed: To suit exact dimensions of the motor installed. Bed logs and floor timbers to be 3-inch white oak well riveted together and to the keel, floor timbers, etc., by ½-inch galvanized carriage bolts with nuts and washers on under side to be accessible for tightening.

Companionway Steps: To be built to provide solid sides with steps fitted between them, also vertical hinged piece extending from the forward edges of each step down to the next step. Steps to be hinged to give access to locker space inside. Each step extends back to provide locker between each step. All to be built of one-inch oak. Rubber treads on steps.

Awning: To have double frame and battens and cover at top. Frame to be of ½-inch galvanized iron pipe of shape indicated, lower frame and upper frame fitted into tee at top of stanchions, which are to be well fitted into galvanized deck flanges. Battens to be ½ x 2 inches riveted to frames. Cover to be 12-ounce waterproof khaki stretched and secured by double awning or curtain fasteners on plate. To these fasteners the side curtains are to be secured. Fasteners space 20 inches. At forward end a mahogany board to be fitted to which forward curtain can be attached and onto which it can be rolled when not in use. Portable section of awning aft to fasten onto permanent section and to fasten to a mahogany board shaped same as top of awning, this board to have sockets on under side into which the two portable stanchions are threaded. Celluloid windows to be fitted in forward and rear curtains.

Steering Gear: A galvanized mahogany-trimmed 24-inch steering wheel with chain and sprocket control to be secured in housing on cabin bulkhead to be connected by 5/16-inch galvanized flexible steel wire rope led along starboard side through 3-inch sheaves and through fairleads to 12-inch galvanized quadrant tiller secured on square head of rudder stock. Latter to be 1½ inches diameter bronze riveted to 3/16-inch brass rudder plate. rudder fitted with pin at bottom fitting into brass skeg secured to keel. Rudder port to be brass pipe to fit stock, fitted with stuffing-box atop. Tiller rope to have turnbuckle fitted for adjustment, sheaves and fairleads fastened by screws, no nails to be used. Tiller rope rigged so that when wheel is moved toward starboard the bow turns toward starboard. Tiller rope to be accessible throughout length.

Fuel Tanks: Two 14 x 60-inch fuel tanks of seamless steel, holding 40 gallons each, to be installed in pine chocks, three in number, with three galvanized steel straps over tanks and attached to cradles. Each tank to have 2-inch fill threaded into deckplate and into tank, vent, outlet with gasoline cock and ⅜-inch seamless annealed copper tubing led from cock at each tank to tee and then to gasoline cock, strainer and carbureter.

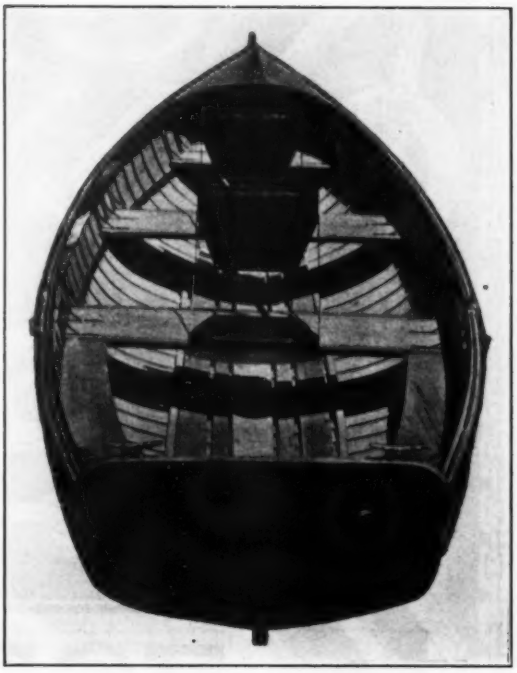
Plumbing: In bow 20-gallon 14 x 30-inch galvanized steel fresh-water tank to be supported by three galvanized steel straps and wood chocking. Fill to be two inches through deckplate. Tank to have vent and outlet for ½-inch galvanized iron pipe with shut-off in line leading to lavatory and sink. Spring faucet at both fixtures. Sink to be 12 x 18 x 6 inches enameled iron. Lavatory of vitreous china. Water closet properly piped up.

(*Continued on page 84*)

Advertising Index will be found on page 126

Skaneateles Boats

The Standard by Which Others Are Judged

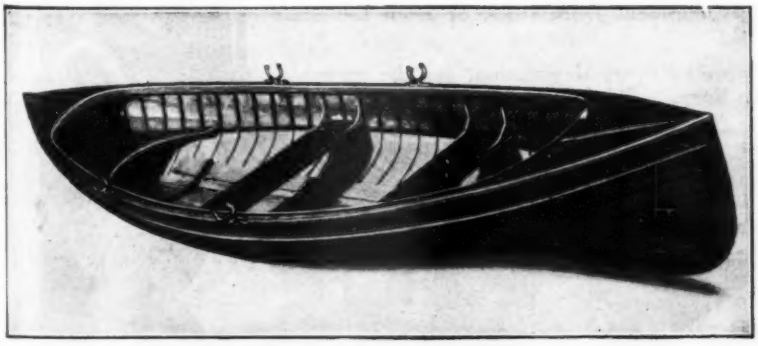


Our Outboard Motor Boats are absolutely the best outboard motor boats made in the world to-day. They are 16 feet long and have a beam of 4 feet. They are planked with selected white cedar. The stem, keel and transom are of selected oak. The decks are of black walnut, mahogany or cherry. The seats are of cypress. All fastenings are of copper and they are copper riveted and burred at the ribs. The trimmings are of nickeled brass or polished brass and one pair of selected spruce oars, 8′ long are included in the outfit. The finish is in the natural wood with best spar coating. The boat weighs approximately 150 pounds. Price, $160, plus $16 war tax and $5 for crating. Price equipped with 2 H.P. Evinrude Motor with built in magneto and automatic reverse, is $275 f. o. b. cars Skaneateles. Immediate or future delivery.

ST. LAWRENCE SKIFFS

Prices from $85 to $250, plus war tax and crating.

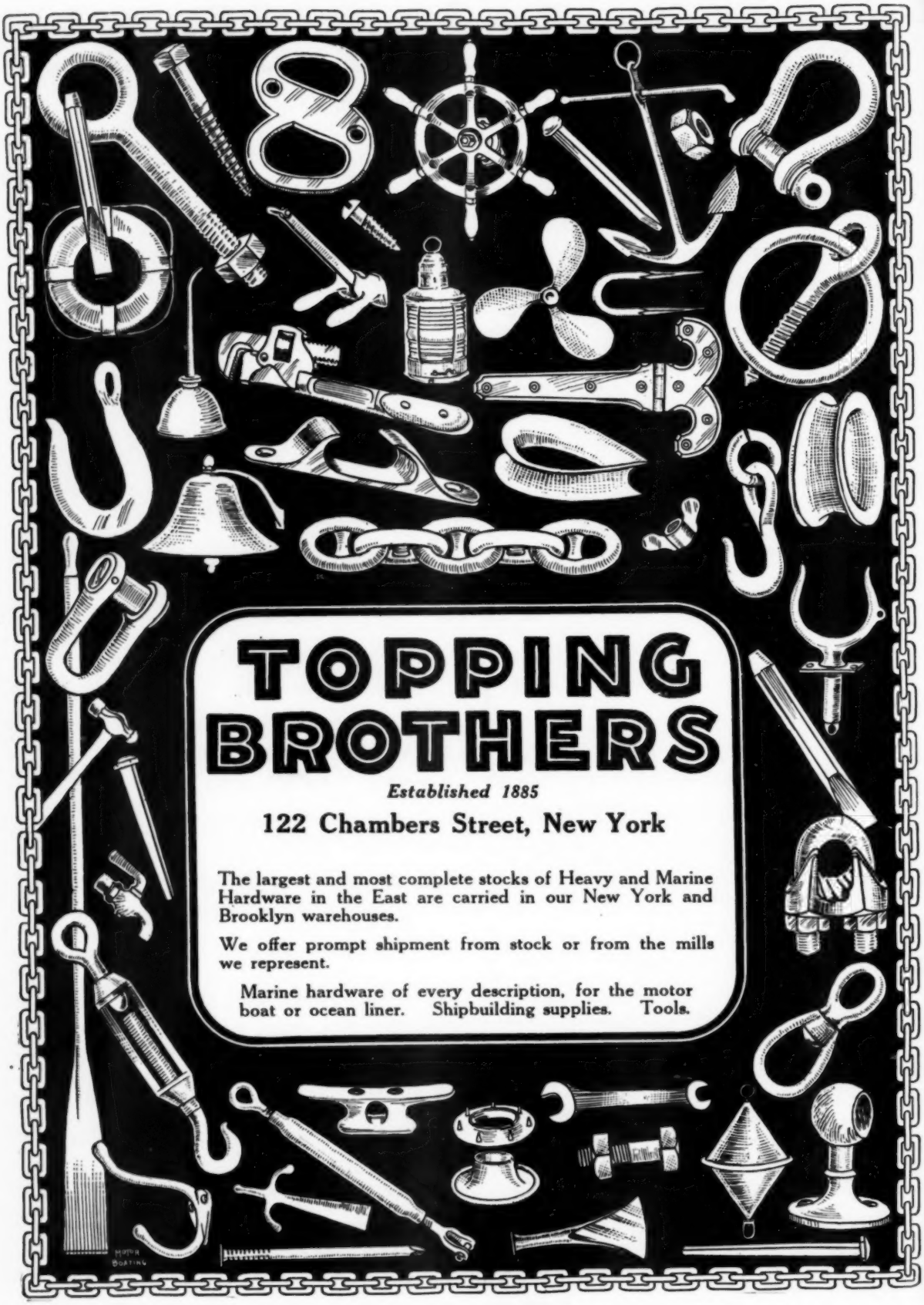
Eighteen foot raised deck cruisers, sailboats, dinghies, surfboats, yacht tenders, etc. always in stock. $75,000 stock insures immediate shipment.



SKANEATELES BOAT & CANOE COMPANY

SKANEATELES NEW YORK, U. S. A.

Builders of the finest row boats in the world



TOPPING BROTHERS

Established 1885

122 Chambers Street, New York

The largest and most complete stocks of Heavy and Marine Hardware in the East are carried in our New York and Brooklyn warehouses.

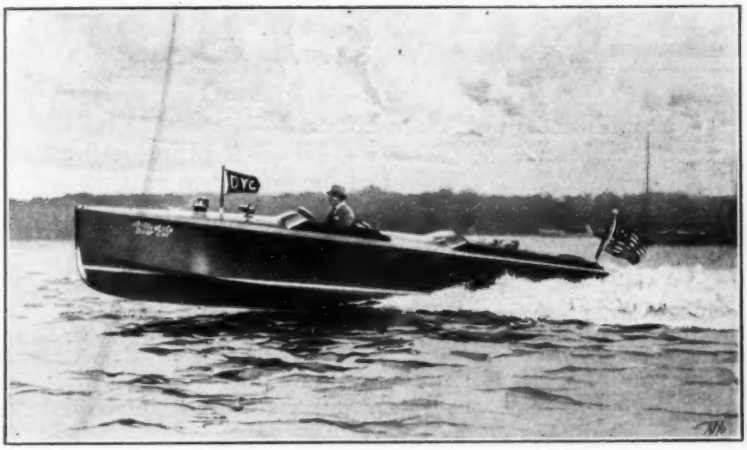
We offer prompt shipment from stock or from the mills we represent.

Marine hardware of every description, for the motor boat or ocean liner. Shipbuilding supplies. Tools.

Advertising Index will be found on page 126

Belle Isle Boats

THE BELLE ISLE "BEAR CAT"



"America's Standard Runabout"

THE Keen Joy of Motor Boating is fully felt for the first time when you ride in a "Bear Cat." All other sports seem tame and all other boat rides fade from your memory when, for the first time, you enjoy the wonderful exhilaration of riding in one of these boats.

No finer runabout is built today than the Belle Isle Bear Cat. With an all mahogany hull and black walnut trim, blue alligator upholstering and completely equipped instrument board it offers all the comforts and refinements that the most critical purchaser would desire.

Powered with 125 Horse Power five by seven four cylinder Hall-Scott Marine (not aviation) motor we guarantee a consistent speed of 32 miles per hour. (Many Bear Cat owners tell us that they are making 35 miles and better.)

Let us send you our illustrated folder with complete particulars of this wonderful boat.

Immediate Delivery from Stock

Manufacturers of the

Davis "American" Dingheys

and

Taft Cup—21 Ft. Cat Boats

ANNOUNCING FOR 1921

Open Launch .....16′-2″ x 4′-2″—	**$275.00**
Open Launch .....18′-0″ x 4′-8″—	**$375.00**
Open Launch .....21′-0″ x 5′-8″—	**$975.00**
Runabout .....24′-6″ x 6′-2″—	**$1,950.00**

All prices include excise tax

Literature on request

Belle Isle Boat & Engine Co.

DETROIT, MICHIGAN

You'll Like the STANDARD Reverse Gear

You'll like its neat clean cut case—keeps your boat clean because the grease and oil are kept inside the case, and dirt is kept out of the gears and bearings.

You'll like its simple adjustment—can be adjusted on the outside of the case while running.

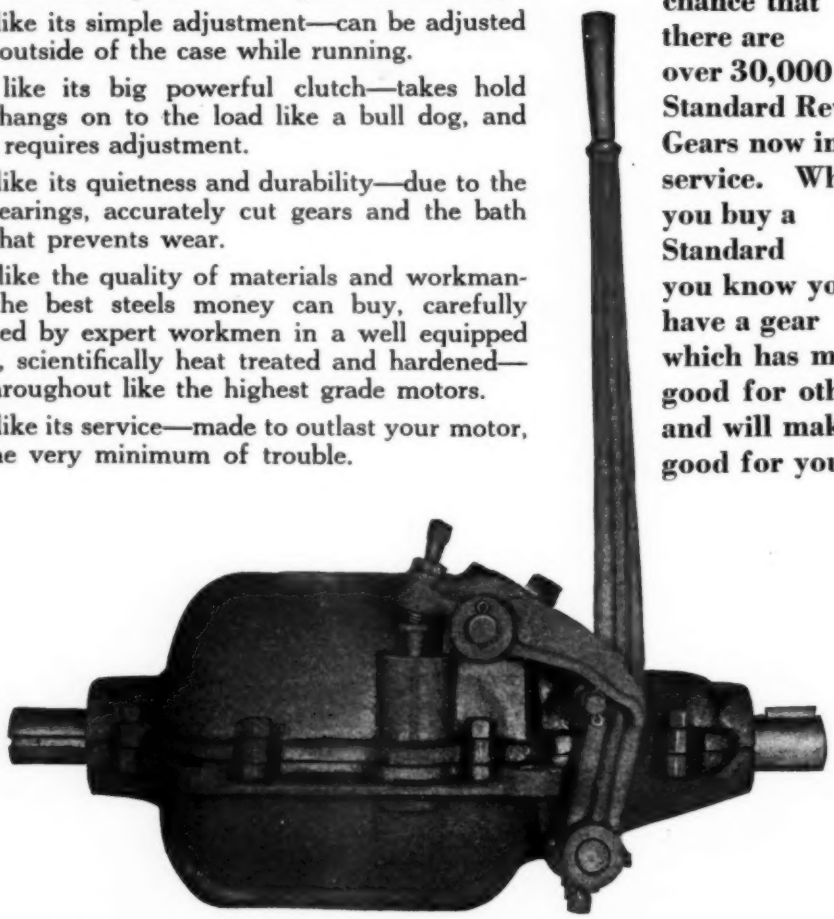
You'll like its big powerful clutch—takes hold easily, hangs on to the load like a bull dog, and seldom requires adjustment.

You'll like its quietness and durability—due to the large bearings, accurately cut gears and the bath of oil that prevents wear.

You'll like the quality of materials and workmanship—the best steels money can buy, carefully machined by expert workmen in a well equipped factory, scientifically heat treated and hardened—built throughout like the highest grade motors.

You'll like its service—made to outlast your motor, with the very minimum of trouble.

It is more than luck or chance that there are over 30,000 Standard Reverse Gears now in service. When you buy a Standard you know you have a gear which has made good for others and will make good for you.



Write today for catalog and prices. Tell us the make and power of your engine and size and type of your boat so we can recommend just the gear you need.

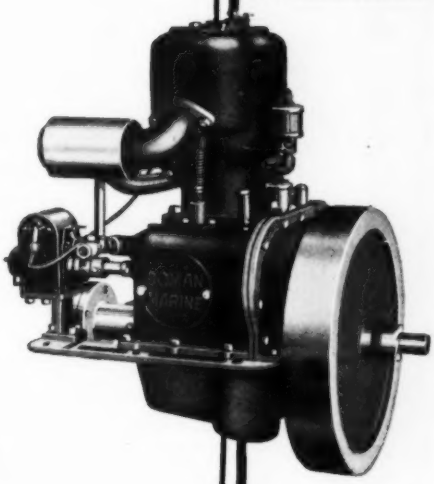
STANDARD GEAR COMPANY

5928 Commonwealth Avenue **DETROIT, MICHIGAN**

Advertising Index will be found on page 126

DOMAN

·OSHKOSH, WIS·



Announcing

A Big-Little Doman 4 H. P. Marine Motor

Believing that there is a demand for a four cycle reliable 4 H.P. Marine Motor, we now offer in Doman quality sustained for 27 years this Model K Doman.

It has 10 features not usually found in entirety in engines of this size, of which mechanically operated intake and exhaust valves are an example.

You are at the mercy of your motor and want to know it is built with the idea of long lived reliable service.

"Of Special Interest"

It was made with material purchased on this present low market and the price is just as reliably right as its quality is certain.

We have kept faith with our owners for 27 years and if you will write for booklet, we will send you information that will help you decide the Motor question safely.

Whether you are a boat-builder, dealer or user, we would appreciate your letting us serve you at least with the information on this New Doman.

Doman Engine Division

UNIVERSAL PRODUCTS CO.

OSHKOSH, WISCONSIN

Also Builders of the Universal Products Isolated Lighting Plants

CHASE
Leatherwove
MADE BY SANFORD MILLS
SANFORD, ME.

'Tis good news to hear that Chase Leatherwove has been proclaimed "the better boat upholstery of today."

Re-upholster with Chase Leatherwove

Write for Samples

L. C. CHASE & CO.....BOSTON
New York Detroit San Francisco Chicago

"JASCO"
SAFETY FIRST
TANK

UNLESS you *know* that your tank is absolutely leak-proof you can never *feel certain* that you are securely safeguarded against loss by fire and explosion.
The "Jasco" Tank is more than a mere container—it's a positive protector of life and property. Made of the finest seamless drawn steel—tested and proved—it will not leak no matter how rough the service. A "Jasco" Tank will make any boat—*your* boat—a better boat. Send for booklet and detailed information.

JANNEY, STEINMETZ & COMPANY
MAIN OFFICE, PHILADELPHIA
New York Office, Hudson Terminal Building

How To Build Dolphin

(*Continued from page* 78)

Towel bar, toilet paper holder, soap dish, tumbler holder, mirror, six bronze coat and hat hooks to be installed in toilet room. In galley 24-inch towel bar, soap dish, tumbler holder, strainer in sink, and 12 brass 1-inch cup hooks to be installed.

Equipment: Set of cushions for cabin and cockpit, filled with kapoc, two galvanized pipe frames for berths, 2 feet x 3 feet. American yacht ensign, bow and stern flag poles, sockets, 6-inch galvanized bow chocks, 6-inch galvanized stern cocks, 20-inch galvanized fog horn, fire extinguisher, 8-inch fog bell, two 3-inch galvanized ventilators for ventilating engine space, 1¼-inch galvanized brass ventilators similar to Fig. 225 Durkee for aft deck, 2½-inch galvanized chain deck pipe, liquid compass with 4-inch card, Zundel electric horn, set of oil running and anchor lights, set of spark and throttle controls, drop-handle reverse control, hand bilge pump of rotary type mounted on bulkhead and piped to discharge overboard, 8-foot boat hook, three-burner stove of owner's selection, six life-preservers, two 30-foot, ¾-inch diameter manila tie lines, anchors and cable of the owner's selection, depending upon local waters, folding table, brass coat and hat hooks in all closets, 2-inch lead pipe scuppers, etc.

Painting and Finish: Inside of hull to be given one coat of priming paint. Topsides given coat of priming paint and at least three coats of yacht white, including transom, sheer, ribband, rubbing ribband, etc. Under body to be given coat of red lead in oil, at least two coats of best anti-fouling copper paint. Canvas-covered raised deck and cockpit floor painted at least three coats of gray paint. Cabin floor painted three coats of gray. Interior finish white with mahogany or oak or bright cypress trim as desired. Boat to be thoroughly cleaned and put in commission clear of all dirt and shavings, etc., in the bilges, etc.

Many Motor Boatmen Pass Lesson No. 1

(*Continued from page* 13)

be saved if they would only observe these few simple rules:

"First. Write on one side of the paper.

"Second. Do not write the questions before the answers, but remember the answers to correspond with the questions.

"Third. Answer 'Yes' or 'No,' wherever possible, and do not elaborate, unless necessary. Many answers are spoiled or marked partly wrong, because a student in his anxiety to show his knowledge displays his ignorance.

"Fourth. Try and mail the answers before the 15th of the month.

"Fifth. Leave at least an inch margin on the left of the paper, and two inches at the top for the examiner to use in making his corrections.

"Sixth. Do not forget to write or print your name in legible letters on your answers.

"Please accept my congratulations on the success of your Course and excellence of the lessons."

The names of those students who passed lesson No. 1 by at least 80% is as follows:

J. Abt, D. E. Ackley, J. Andersen, M. Anderson, R. Andren, B. A. Aycrigg, W. B. Barnett, J. L. Barnes, C. Baron, W. A. Baxter-Gould, P. S. Benedict, Dr. A. B. Bennett, Jr., U. L. Berger, F. H. Berry, J. Bertram, W. H. Bisbee, J. Bister, W. Bliss, C. M. Blum, W. G. Boyden, H. Boche, S. M. Bradley, L. F. Brower, J. C. Brodhead, C. A. Bradley, H. F. Brown, C. A. Brown, H. R. Broll, W. S. Betts, L. Burch, W. A. Butler, C. E. Burch, H. Byers.

J. Calvert, E. L. Chase, F. S. Cheney, M. Gibener, G. M. Clubb, W. A. Cornell, R. Cox, L. L. Crosthwaite, C. W. Culver, W. J. Cummings, O. L. Crossley, C. N. Crosby.

L. Dannecker, R. Dart, M. M. Davis, F. H. Delano, H. S. Denner, E. N. Des Rosiers, W. W. Dickson, A. Dingman, G. A. Deorner, E. Donkin, H. Dietz, L. Dubois, J. B. Dunbaugh.

A. Ek, A. Eppler, V. L. Evans, A. Fenton, W. Feser, J. A. Filsner, R. Finigan, H. O. Finger, E. F. Folda, V. Francis, G. M. French, N. D. Gillespie, W. H. Goodman, W. J. Gorton, W. M. Gray, W. D. Groesbeck, C. F. Grush, W. Gustofsen, G. I. Gutjahr, G. Hachen, J. Haffen, J. A. Hain, Rev. A. M. Hainer, W. H. Haller, E. Halliday, W. R. Halsey, W. H. Hanssom, G. Hansen, R. D. Harding, L. L. Harrington, W. H. Harris, W. A. Hart, I. Harrison, E. W. Henrikson, F. P. Hara, G. Hill, H. J. Hogdon, L. Hoffman, H. Holmes, G. Holub, H. R. Houser, C. Honlroyd, L. H. Howe, G. Hoynes, C. Holzkamp, F. P. Horton, J. B. Hooper, C. H. Howell, E. D. Hamilton.

E. A. Jones, J. Jenke, P. R. Johnson, R. M. Johnson, E. J. Jones, A. E. Jones, Mrs. E. J. Kaiser, B. W. Kaiser, F. D. Kelle, J. Kellner, F. J. Kensler, E. D. Kenyon, G. F. Killam, J. W. King, H. H. Kingston, Jr., W. C. Kress.

C. M. Labunski, L. B. Larsson, L. B. Lange, G. R. Law, Jr., L. A. LeVan, F. Lewis, G. H. Long, J. B. Losee, J. W. Lough.

C. Mager, W. C. Malin, M. L. Mandel, C. Mann, H. A. Mann,

(*Continued on page* 88)

Advertising Index will be found on page 126

Wisconsin

CONSISTENT

Marine Motors

Built in the following sizes:

EM—4 x 5—4 cylinder
AM—4¾x5½—4 cylinder
MM—5¾x7 —4 cylinder
GM—4¾x5½—6 cylinder
PM—5¾x7 —6 cylinder

Vital Power

The exacting requirements of the United States Coast Guard in life saving service demand that motors must, above all other considerations, be consistent in performance.

There is neither time nor place for a power plant that can not prove its right to use in all sorts of weather, particularly when life and property are at stake.

Wisconsin Motors, because of their inherent qualities of dependability at *all* times—their consistent service at a moment's notice, no matter what the conditions—are selected by the government for life boats.

This recognition of merit can be capitalized by boat owners and intending builders. There are models for all sizes of boats—from the small runabouts to the twin screw cruiser.

With the knowledge that dependable service is his when a Wisconsin Motor is installed, the boat owner can rest assured that there never will be a time when he will regret his choice of a power plant.

Wisconsin motors always serve to the utmost—in fair or "dirty" weather.

Send for the "Wisconsin" Marine Catalog.

Wisconsin Motor Mfg. Company
Milwaukee **Wisconsin**

Distributors
T. M. FENNER, 21 Park Row, New York City
WISCONSIN MOTOR PARTS CO., 2354 Cottage Grove Ave., Chicago, Ill.
CHANDLER-HUDSON CO., Seattle, Washington
EARL P. COOPER CO., 1310 S. Los Angeles, Los Angeles, Cal.

An Achievement in Small Craft Design

DESIGNED by one of the foremost naval architects—built by a company with a lifetime of experience in building small craft, the Burger 36 Ft. Cruiser is a masterful example of what has been accomplished by incorporating the comfort and roominess of larger and more expensive boats into a graceful and well-built cruiser, but thirty-six feet long.

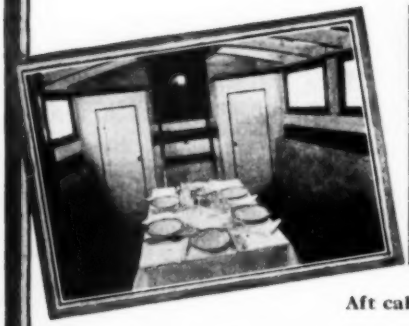
The pleasing lines and balance of the Burger 36 Ft. Cruiser, together with its ample deck room and commodious arrangement below, recommend it to the discriminating buyer who is looking for a value extraordinary in small craft.

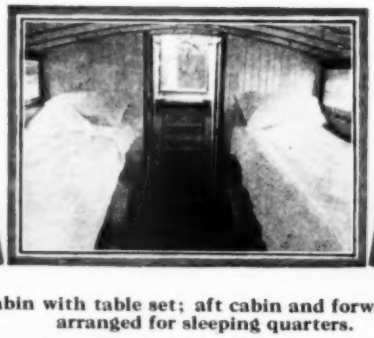
The spaciousness of the aft cabin is a feature much appreciated in this cruiser. For a lounging room, sleeping quarters or dining room, it is ideally adapted to accommodate six people. Its arrangement is convenient and comfortable and access may be gained by the forward companionway leading to the bridge deck or the aft companionway opening out on the after deck.

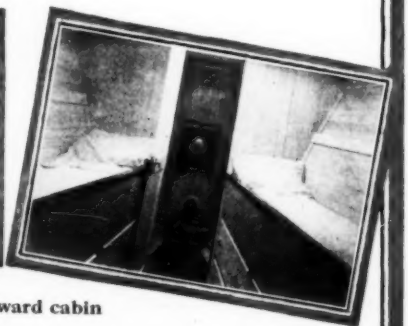
The forward cabin is equipped with two roomy berths and eight large drawers. Two lavatories and a well-arranged galley also add to the accommodations of this fine cruiser and the engine room affords two bunks, a work bench and cupboard for parts and tools.

We will gladly send you our handsome book containing photographs and a complete description of the Burger 36 Ft. Cruiser

BURGER BOAT COMPANY, Manitowoc, Wis.







Aft cabin with table set; aft cabin and forward cabin arranged for sleeping quarters.

Immediate deliveries from stock. Price without war tax, $4950.00 delivered at Manitowoc, Wis.

BURGER

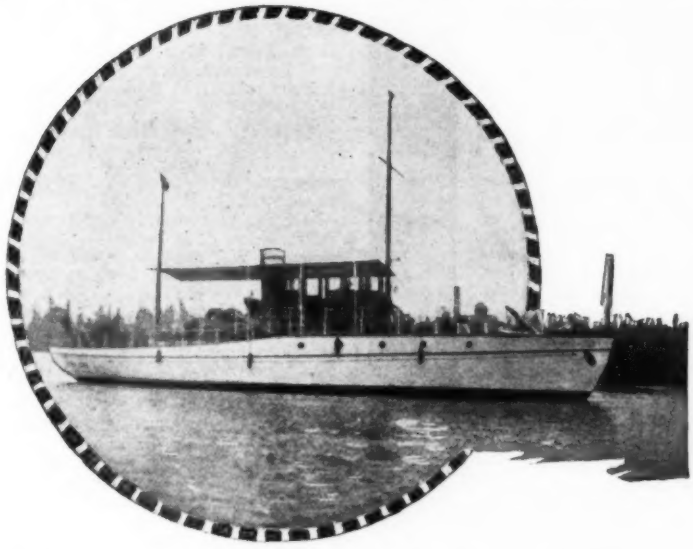
BOATS BEAUTIFUL

We also build a 26 ft. Runabout, designed by John L. Hacker. Speed 25 miles. Complete details on request.

Advertising Index will be found on page 126

Scripps

"The Motor That Crossed the Atlantic"



"Pom-Pom" Made Happy

"Pom-Pom" is a real all weather ship 56 ft. overall, owned by Mr. William Russell of the Russell Lumber Company, Port Arthur, Ont., and is now amply powered by a pair of Model D-6 medium duty Scripps motors.

Her previous power plant consisted of two heavy duty engines of a well-known make of larger size and of higher price as well, than the two D-6 Scripps Models that were installed last Spring. The first power plants delivered a speed of but 9½ miles, and it was decided to make a change, to increase speed, cut down operating and fuel expense, and to get away from objectionable noise and vibration.

Two D-6 engines were prescribed for this purpose, and when given the acid test, did not disappoint their sponsors.

The speed was increased from 9½ to 13 miles, the outlay for fuel received a generous cut and vibration was totally eliminated. Mr. Russell obtained even better results than he had hoped for in the way of speed, comfort and economy, while Scripps "Built-in Service" made it unnecessary to even think of a service man.

Bear in mind that the previous power plants were not cheap engines, but high class motors of greater bore and stroke than the Scripps replacement engines, a pretty good indication of the pep, stamina, reliability and economy of the "D" Series Scripps, which develop more power than other marine motors of like bore and stroke.

Every motor in the Scripps line will perform in the same manner. Two, four and six-cylinder, medium duty and high speed types, with the option of gasoline or kerosene equipment, 10 to 125 horse-power. Solve your boating problems by putting in an engine that has been famed for its reliability for over 16 years and that is up to the minute in the latest engine refinement.

We also build stationary power plants for operating pumps, compressors, small machine shops, etc.

SCRIPPS MOTOR COMPANY

5819 Lincoln Avenue **Detroit, Michigan, U. S. A.**

"Every Moving Part Enclosed"

Sturtevant
(REG. U.S. PAT. OFF.)
75 H. P. LIGHT WEIGHT ENGINE
AN UNUSUAL ENGINE FOR UNUSUAL BOATS
If an engine of the highest quality—one which is efficient, reliable, and clean-cut in appearance—interests you, investigate the Sturtevant E4.
Built on special order during the past six years.
Now standardized and ready for general distribution. Catalog No. 26826
PARR-LOICHOT ENGINE CORP., Agents
380 Canal Street New York City
B. F. STURTEVANT COMPANY
HYDE PARK, BOSTON, MASSACHUSETTS

GRAY-ALDRICH COMPANY, Inc.
84 Atlantic Avenue Boston, Mass.

Rebuilt Engines

All engines thoroughly rebuilt unless otherwise specified.

255	36 H.P.	Lathrop, 3 cyl. 2 cyc. and rev. gear	$700.00
275	80 H.P.	Wolverine, 3 cyl. 4 cyc. prop. and rev. gear	2500.00
277	16 H.P.	Lathrop, 2 cyl. 2 cyc.	285.00
287	24 H.P.	Lathrop, 2 cyl. 2 cyc. and rev. gear	425.00
292	5 H.P.	Lathrop, 1 cyl. 2 cyc. overhauled	65.00
299	24 H.P.	Lathrop, 2 cyl. 2 cyc. no rev. gear	350.00
300	3 H.P.	Faultless Seine Purser, 2 winch heads	135.00
302	5 H.P.	Wolverine with rev. gear	175.00
303	16 H.P.	Lathrop, 2 cyl. 2 cyc. with coupling and prop.	310.00
307	16 H.P.	Lathrop, 2 cyl. 2 cyc.	267.00
312	20 H.P.	Lathrop, 2 cyl. 2 cyc.	380.00
320	215 H.P.	Van Blerck, Model J-8 cyl. Elect. Starter	1850.00
329	24 H.P.	Lamb, 4 cyl. 4 cyc. with rev. gear	600.00
330	90 H.P.	Buffalo, Model "Q" high speed, rev. gear and mag.	1000.00
331		Paragon Reverse Gear, Model "C"	75.00

TRENHOLM FUEL VAPORIZERS for using kerosene fuel on four cycle engines. Vaporizer circular on request.

Many Motor Boatmen Pass Lesson No. 1

(*Continued from page* 84)

E. Matson, L. F. Merritt, L. T. Mills, C. S. Mitchell, R. H. Miller, J. Mosarec, H. H. Morton, C. H. Moore, W. B. Moores, A. Moulton, H. D. Moore, W. J. Mozart, A. A. Moore, C. H. R. Mulvihill, W. W. Murphy, V. T. Myers, Dr. P. D. MacSween, J. McElreath, Jr., D. C. McClean, P. F. McMahon, D. J. McCarthy, J. McHenry, J. L. McKenzie.

J. Needham, J. S. Newcomb, F. A. Nordling, A. W. Norman, M. S. Noyes, J. F. O'Brien, C. E. Patterson, L. Pensmith, F. Pope, C. A. Philpott, L. R. Philpott, C. D. Porter, B. S. Pierson, R. S. Pollock, H. H. Powel, T. W. Poland, A. Porter, G. A. Patrie, R. V. Parke, H. M. Preston, H. Quick.

J. Rawlinson, G. A. Rawson, W. E. Redford, A. M. Reese, J. Reinhardt, H. L. Remsen, J. Reichester, I. Reiner, R. B. Rives, W. Robson, W. S. Roedel, J. H. Rogers, D. Rooke, A. G. Rooke, M. J. Ross, M. B. Ross, E. Roxby, F. Rudolph.

C. Sanders, G. Schumakoff, O. M. Schreiber, W. Schumacher, Dr. J. F. Schefcik, W. N. Shrum, Major C. P. Shinn, H. R. Sherman, H. P. Shay, W. E. Shannon, J. K. Sexson, O. H. Sherbrook, J. H. Shrieves, A. Sipos, J. H. Sharpe, W. E. Sisson, S. E. Slocum, W. Slocum, D. O. Smith, A. D. Smith, B. T. Smith, F. B. Smith, C. T. Smith, D. V. Smythe, Jr., F. B. Smith, C. E. Smith, D. Spoor, E. U. Strobel, R. B. Stanley, H. R. Stiles, P. R. Stephenson, M. Stelle, H. A. Stahl, W. B. Staley, A. G. Steltzner, A. Swift, F. Shay.

D. Taylor, E. Taylor, Dr. W. H. Taylor, W. M. Taylor, W. C. Temple, O. A. Thomas, A. A. Thomas, S. H. Thomas, G. H. Thurston, C. P. Tockildsen, F. A. Tomlinson, E. E. Torchio, F. C. Travers, T. E. Trembla, B. Tucker, F. E. Suttle, I. G. Teasdale.

H. Underwood, R. F. Wallace, A. L. Warren, Dr. H. E. Watkins, F. B. Watson, C. Weltner, J. C. Wilson, Jr., S. F. White, C. Williamsen, C. E. Wilson, L. Williams, F. Woodman, W. O. Yates, C. S. Young, H. L. Young, H. T. Zachgo, M. A. Young.

Subjects Which Will Be Covered in Various Lessons

Lesson No.

1. Rules of the Road, Rights of Way, Proper Whistle Signals, Duty When Underway, Day and Night Sailing.
2. Types and Classes of Motor Boats and other Power and Sailing Vessels, Lights for All Classes of Vessels.
3. Navigation and Government Lights, Lighthouses, Lightships, Range Lights and their Characteristics and Classification, Aids to Navigation, Distress Signals by Day and Night, U. S. Coast Guard Signals, Wind and Weather Signals, Fog Signals for Various Types of Boats, Day Marks for Vessels.
4. Buoys of Various Types. Colors and Numbers, Uses and Meaning. Can, Nun, Spar, Bell, Whistling, Lighted and Combination Buoys. Starboard and Port hand Buoys, Channel, Obstruction, Anchorage and Turning Buoys.
5. Equipment Required by Law for various Types of Boats, International, Inland, Pilot and Motor Boat Rules and Regulations, Government Publications, the Light and Buoy Lists, Tide Tables, Coast Pilots, Notice to Mariners.
6. The Compass.
7. Variation, Deviation, Magnetic and True Courses, Compass Errors and their Application, Various Methods of Determining Compass Errors, Leeway.
8. The Chart, Various Kinds of Charts, Where to Obtain Them, Their Use, Various Markings on Charts, etc.
9. Nautical Instruments, the Log and Lead Line, Sounding Machines, Pelorus, Azimuth, Protractor, Parallel Rules, etc.
10. Piloting and Chart Work, Laying Courses, Determining Position by Various Methods, Allowing for Tides and Current, Danger Angles.
11. Small Motor Boat Handling, Steering, Engine Room Signals, Action of Propeller, Action of Winds and Current, Shallow Water Indications, Tide Rips, Head, Beam and Following Sea, Picking up Mooring, Making Landings at a Float and Wharf, the Dinghy, Landing in a Surf, Navigation in Fog, Crowded Waters, Anchoring, Docking, Practical Aids in Boat Handling.
12. Cruising, Proper Equipment to Carry, Keeping a Log, Sun and Clock Time, Duties of Various Members of Crew.
13. Flags and Colors, Yachting Etiquette, Signalling.

Advertising Index will be found on page 126

America's Most Picturesque Motor Boat Cruise—Enjoy It This Year

TRENT WATERWAY, ONTARIO, CANADA

Direct from the Great Lakes through the Heart of Ontario's Highlands —Over Two Hundred Miles of Beautiful Lakes and Rivers

Champlain's Historic Route—Lake Huron to Lake Ontario

Champlain's Famous Voyage in 1615

Through the dense wilderness in 1615, the heroic explorer Champlain, the first white man to traverse what is now the Trent Route, led the Huron Indians in a fleet of 200 canoes in a warlike expedition against the Iroquois. The historian Parkman refers vividly to Champlain's delight on his first glimpse of this "Nature's Playground". Champlain in his diary says: "These lakes as well as the river which flows from one to the other, abound in fish and the whole country is very beautiful and attractive." Along the picturesque shores, he added, it seemed as if the trees had been "planted for pleasure".

A FEW FACTS RELATING TO THE CRUISE

1. No lockage charges—good service.
2. No customs restrictions.
3. Draft—8 feet, Lake Ontario to Peterborough; 6 feet, Peterborough to Washago.
4. From Washago to Georgian Bay for boats 33 feet length, 9 feet beam.
5. Locks at Lake Simcoe 33 feet wide; maximum length steamer or motorboat, 118 feet; maximum length wide barge, 104 feet.
6. Sunday locking at certain hours.
7. Buoyed practically entire route. Going up-stream — keep RED on Right; keep BLACK or WHITE on Left.
8. Peterborough and Kirkfield Hydraulic Lift Locks 65 feet and 48 feet, respectively.
9. Water and Hydro Electric Development through entire route.
10. Excellent camping and fishing grounds.
11. Supplies of all kinds available en route.
12. Modern hotel and rooming accommodation at all cities, towns, villages and summer resorts.
13. From Lake Simcoe, short radial run to Toronto.
14. From Orillia or Washago, short rail journey to Muskoka Lakes.

For any further information write the Secretaries, Boards of Trade of Trenton, Campbellford, Hastings, Lakefield, Bobcaygeon, Lindsay, Fenelon Falls, Beaverton, Sutton, Barrie, Orillia, Port Severn, Midland, Penetang, or the

Secretary, TRENT WATERWAY DEVELOPMENT ASSOCIATION

Peterborough, Ontario, Canada

MOTOR BOATING PRACTICAL HAND-BOOKS

Every motor boatman has long felt the need for a really complete and comprehensive library devoted to their favorite pastime—motor boating. One of the obstacles to the accomplishment of this important work was the difficulty in finding any one writer who could cover the field in its entirety. In presenting the new series of practical hand-books, MoToR BoatinG believes that the problem has been solved at last. These books are edited by Charles F. Chapman, M. E., the editor of MoToR BoatinG, and they are the results of months of untiring effort on his part, together with the best of thousands of suggestions sent to him by motor boatmen themselves. The list of the contents given below will give you some idea of the vast amount of ground covered by these volumes.

Practical Motor Boats and Their Equipment

Volume 1.—The first volume tells you what the ideal boat for various kinds of service should be and what to look for in buying a boat. Many suggestions about decoration and hints on all kinds of equipment. All about steering gears, wireless outfits, electrical attachments, etc. Glance over the list of contents appended herewith: Hulls, Ballast and Seaworthiness; Round Bottom *vs.* Sharp Bilge; What are the Advantages of Flare? Raised Deck *vs.* Trunk Cabin; Best Proportion of Beam to Length; Selecting a New Design; The Advantages of Bilge Keels; Open or Solid Deadwood? What Makes a Hull Seaworthy? The $1,000 Cruiser; Buying a Second-Hand Boat; Types of Bows and Sterns; Exterior Arrangement of Cruisers; The Best Cabin Arrangement; Finishing Up the Cabin; Changes in Interior Arrangement; Interior Arrangement for Open Boat; Propeller-Rudder Arrangements; Best Position for the Rudder; Advantages of the Outboard Rudder; Different Steering Positions; Steering Equipments for Motor Boats; Steering Gear for the Cruiser; The Steering Gear for a Runabout; Steering the Boat from the Side; The Electrical Equipment; Making and Wiring a Switchboard; Electric Lighting on a Motor Boat; The Inexpensive Lighting Outfit; Wiring the Small Cruiser; The Storage Battery; The Dynamo Cut-Out; Wireless for a Small Cruiser; Tender for a Thirty-foot Cruiser; Building a Folding Dinghy; Installing the Boat Boom; What is the Best Galley Arrangement; Ventilating the Galley; The Galley Stove and Its Installation; Making a Fireless Cooker; A Portable Cook Box; Running Water for the Cruiser; How to Build a Portable Table; A Table for the Open Boat.

Practical Motor Boat Building

Volume 2.—As its title implies, this volume takes up the building of your own boat. It also covers the construction of the necessary fittings such as awning, windshield, etc. Every boatman sometime or other builds a boat, and a book of this kind will save much time and prevent many mistakes. List of contents: Types of Motor Boat Fastenings; Boat Building Woods; Laying Down a Boat's Lines; Converting a Trunk-Cabin Cruiser; A Steam Box for Amateur Builders; Joiner Between Stem and Keel; Fastening the Frames and Floors; Boring the Forgotten Limbers; Fitting the Garboard Plank; Boring the Shaftlog; Fitting the Stuffing Box; The Stern Bearings for a Cruiser; A Water-Tight Companionway; How to Canvas a Deck; Hinged Water-Tight Hatches; Making a Water-Tight Hatch; The Coaming of an Open Boat; Fitting a Swinging Port Light; Making a Self-Bailing Cockpit; A Water-Tight Window Sash; Making a Water-Tight Skylight; How to Build an Engine Housing; How to Make an Engine Cover; Building a Tool Locker; Constructing an Extension Transom; How to Make a Pipe Berth; An Ice-Box for a Cruiser; Installing a Toilet; How to Rig a Signal Mast; How to Make a Spray Hood; Fitting a Folding Windshield; An Awning for the Open Boat; A Cover for the Open Cockpit; Screens for the Side Light; A Support for the After Light; A Seat for the Man at the Wheel; Removable Davits for the Cruiser; The Boarding Steps; A Bow Rudder for Your Hydro; The Motor-Driven Club Tender.

Practical Things Motor Boatmen Should Know

Volume 3.—Navigation is one of the important subjects covered in volume three of the series. Tells you how to steer, how to increase the factor of safety, and a host of other things relative to the proper running of your boat. The chart and compass are both fully explained in a clear and comprehensive manner. The list of contents will tell you more about it; Advice for the Beginner; Lessons Learned from Experience; Good Things to Know; Increasing the Factor of Safety; Which Way Should the Boat Steer? Why a Boat Steers Badly; Why do Boats Squat? Figuring the Boat's Speed; Ballasting the Cruiser; Getting Off Bottom; To Ride Out a Storm in a Motor Boat; The Why and How of Storm Oil; Preventing Fire; Handling Ground Tackle; Government Charts; Stowing the Anchor on a Cruiser; Diminishing Deviation; Preventing Electrolysis; Stowing and Using Charts; How to Make a Chart Case; Keeping a Motor Boat's Log; How to Make a Sextant; Tides and Tidal Waters; Taking Her Through the Canals; The Best All Round Dinghy; Towing the Tender; Handling the Dory in a Seaway; Getting the Tender Aboard; Planning for a Cruise; Equipping for a Cruise; Equipment for Offshore Cruising; Novel Events for Regatta Day; Handicapping; The Object of a Handicap Rule; Laying Off a Race Course; Measuring the Length of a Race Course; Preparing a Boat's Bottom for a Race; How to Build a Turning Buoy; Starting Boats in a Race; Stowing the Signal Flags; Fitting a Gun Mount; A Fish Box for Your Cruiser; A Cabin Wall Rack.

Practical Marine Motors

Volume 4.—All about the marine motor; what it should and should not be. Tells why the automobile engine is unsuccessful in marine work. The best location for your engine, the ideal engine bed, the fuel tank, exhaust and countless other suggestions that will enable you to get the best results from your power plant. List of contents: Purchasing a Marine Motor; How Many Cylinders? Power per Cylinder; High Speed *vs.* Heavy Duty; Long Stroke *vs.* Short Stroke; Correct Motor Design; Changes in One's Power Plant; The Things that Cause Vibration; The Automobile Engine for a Boat; The Best Position for the Motor; The Ideal Engine Compartment; Placing the Engine in the Hull; Installing a Motor in a Canoe; Installing Power in a Yawl; Converting a "Banker" to Power Engine Installation in a Hydroplane; Putting Power in the Rowboat; Limits of Shaft Inclination; Constructing the Engine Bed; Getting the Motor Aboard; Lining Up the Propeller Shaft; The Best Exhaust; Mufflers *vs.* Under-Water Exhausts; Installing an Under-Water Exhaust; Primary Batteries for Ignition; Keeping the Ignition System Dry; Installing a High-Tension Magneto; From Make and Break to Jump Spark; Installing the Gasoline Tanks; Taking Care of Extra Gasoline; Spark and Throttle Controls; Constructing a Rear Starter; Propeller for Engine and Hull; Installing a Universal Joint; Gearing Motor to Propeller Shaft; The Automobile Throttle; Harnessing the Main Engine; Rebabbitting a Worn Bearing; Should Fuel Line be Inside or Outside.

Practical Motor Operation and Maintenance

Volume 5.—One of the most valuable books of the entire set. Your motor's ills and how to cure them. This volume tells you how to adjust your carburetor, how to fit piston rings, how to remedy poor compression and a number of other things that will enable you to doctor your own motor. List of contents: Locating the Motor's Troubles; The Overheated Motor; Starting in Cold Weather; Overhauling a Marine Motor; How to Save Fuel; The Fuel Situation; Using Low Grade Fuel; How to Run on Kerosene; Supplying the Fuel to the Carburetor; Adjusting the Carburetor; Cleaning the Fuel Tanks; Cleaning the Gasoline Line; Stopping Up the Leak in the Tank; A Home-Made Gasoline Gauge; Carrying an Extra Supply of Oil; Mixing the Fuel and Lubricant; Remedying Leaky Compression; Killing the Carbon Jinx; Tool and Spare Parts to Carry; Removing and Replacing Piston Rings; Repairing a Leaky Cylinder; Grinding a Motor's Valves; Setting the Valves; Timing the Ignition System; Cleaning the Water Jacket; Making and Fitting a Gasket; Patching Up a Bearing; Straightening the Sprung Shaft; Truing a Bent Propeller; Removing the Flywheel; Separating Couplings and Pipe Fittings; Changing the Shaft Hole Location; Utilizing the Exhaust; Disposing of the Bilge Water; Heating a Small Cruiser's Cabin; Operating the Outboard Motor; The Clean and Quiet Boat; Charging a Storage Battery; When the Motor Stops Unexpectedly; Making a Unit Power Plant.

Practical Suggestions for Handling, Fitting Out and Caring for the Boat

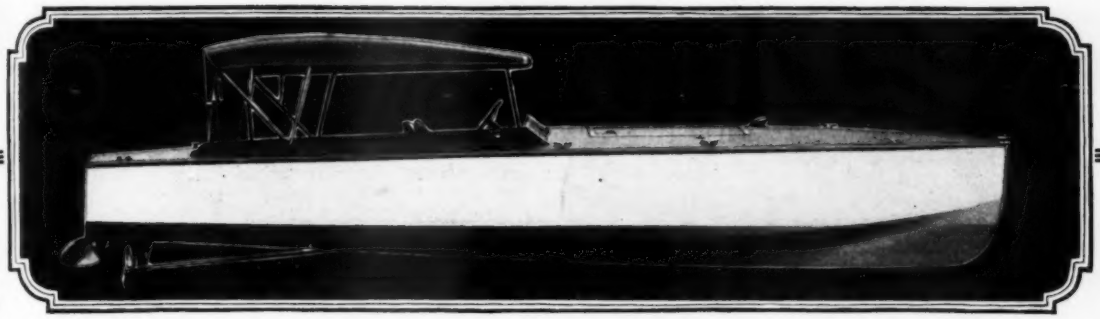
Volume 6.—This volume is an especially valuable one. You will find in it points covering the care of your boat that you never dreamed of before. Whether you are a beginner or a finished expert this book will give you a better knowledge of the handling of your craft than you can imagine. List of contents: Putting the Boat into Commission; Fitting Out a Thirty-Footer; Suggestions for the Beginner; Refinishing Bright Work; Keeping the Wood Surface Bright; Putting the Boat Out of Commission; Laying Up an Unsheltered Boat; Hauling Out for the Winter; Covering the Boat for the Winter; Launching from a Wharf; Correcting Faults; Lengthening Out the Boat; Moorings and Buoys; Taking Steps to Safeguard the Anchor; What to Use in the Bilge; Preserving the Wood in Boats; Emergency Rigs for the Cruiser; Auxiliary Sails for the Cruiser; Providing an Emergency Rudder; Preparing for Southern Waters; Stopping the Troublesome Leak; Replacing a Broken Plank; Removing Broken Lag Screws; Raising the Boat's Stern; Clearing the Propeller; Protecting the Bow and Stern; Open Boat Sleeping Quarters; Ventilating the Cabin of Small Cruisers; Converting the Open Boat to a Cruiser; Making a Cover for the Open Boat; Preventing Electrolysis; Building a Club Float; A Floating Boathouse; Constructing a Landing Stage; Building the Marine; Keeping the Thief Out; A Place for Your Shore Clothes; Stowing for Life Preservers; The Winter's Alterations; What Changes Shall I Make; The Satisfactory Bilge Pump; The Pressure Water System; Making a Pelorus; Your Storm Curtains; Life-Saving Equipment; The Absent Owner's Anchor Light; Mounting the Reverse Gear.

Price $1.50 Per Volume, or $7.50 Per Set of Six Volumes of Over 1,000 Pages

The books measure 7 x 10 inches and are handsomely bound in cloth. Each volume is fully illustrated and printed in clear type on fine paper.

MoToR BoatinG **119 West 40th Street, New York**

Advertising Index will be found on page 126



Mullins "V" Bottom Boat

A Luxurious Runabout that Fulfills Every Demand

The universal need for a motor boat that meets every requirement has been met by the newest of Mullins steel boats—the "V" bottom. A trickle of power from its splendid motor, sends it skimming over the water at a gentle pace, to the delight of those who favor a lounging speed. For those who prefer racing speed, a torrent of power is always in reserve to send them hurtling through the seaway.

The distinctive "V" shaped hull enables it to attain greater speed per H.P. than is possible with a round bottom boat. It is absolutely safe at either low or high speed. No rolling or danger of tipping. Shipping no spray, even in the roughest chop, it is a dry, comfortable pleasure craft. Because of its shallow draft and puncture proof construction it is well fitted for shoal waters.

MULLINS STEEL BOATS CAN'T SINK

Ample air compartments fore and aft, make Mullins boats safe as lifeboats. The steel hull rides light and retains its shape. No seams to open. No calking or scraping necessary. Can't leak, warp, rot or waterlog. No boathouse needed. Low upkeep. Powered with the finest marine motors.

Mullins boats are known and used all over the world. Over 70,000 now in service. Designed and built in the world's largest boat factory.

Write for complete description of the new Mullins "V" bottom steel boat. New catalog showing many types of power boats, rowboats and canoes, will be mailed to you on request.

THE MULLINS BODY CORPORATION

Boat Department

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Michigan Marine Motor

Write for Folder Today.

The ENGINE You Have Been Waiting For.

Repairs At Any Ford Garage

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STURDY—RELIABLE—ECONOMICAL

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—USER OR DEALER—

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The principle of a True Screw is strictly followed out in the patterns from which all genuine Harthan Propellers are made. This type is known to be the most efficient.

Harthan wheels are made of a special bronze composition, very tough and strong. This allows a very thin blade, the edges of which are brought down very sharp, which, with the extra high polish, reduces the power-absorbing element to a minimum.

We can supply propellers with two or three blades, in practically any pitch, either right or left hand.

Look for the Trade-Mark on Each Blade

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NEW YORK: Topping Bros., 122 Chambers Street.

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Buoys, What They Mean and How to Use Them

(*Continued from page* 15)

Buoys originally were either solid wooden spars or built up in various shapes of wooden staves, like barrels. Wooden spars are still extensively used, particularly in inside waters; but built-up buoys are now constructed of iron or steel plates.

In order to give the proper distinctiveness, buoys are given certain characteristic colors and numbers; and following the uniform practice of maritime nations generally, Congress, by the act of September 28, 1850, prescribed that all buoys along the coast or in bays, harbors, sounds or channels shall be colored and numbered so that passing up the coast or sound or entering the bay, harbor or channel, red buoys with even numbers shall be passed on the starboard or right hand; black buoys with odd numbers on the port or left hand; buoys with red and black horizontal stripes without numbers shall be passed on either hand, and indicate rocks, shoals or other obstructions, with channels on either side of them; and buoys in channel ways shall be colored with black and white perpendicular stripes, without numbers, and may be passed close-to, indicating, mid-channels. Buoys to mark abrupt turning points in channels or obstructions requiring unusual prominence are fitted with perches or staves surmounted by balls, cages or other distinctive marks.

This system of coloring and numbering buoys is fairly convincing but by no means conclusive. The expression "passing up the coast or sound, or entering the bay, harbor or channel," may mean one thing to one man and exactly the opposite to another person. Theoretically, the system of colors may be perfect, yet in practice does not always work out unless one checks his position with a chart. Many situations may develop in actual practice of such a nature that one may be both entering one harbor and leaving another at the same time. In such a situation the chart must be referred to, to determine whether the system of coloring that has been selected refers to leaving the one harbor or entering the other. One might also be passing up the coast and leaving a bay at the same time. In such a situation the system of coloring refers to one of these, *i. e.*, either considering that you are "passing up the coast" or that you are "leaving a bay." But it can not and does not refer to both. Therefore, unless one is sure to which condition it does refer he is likely to go wrong unless the proper caution is observed.

Buoys marking light-vessel stations are placed in close proximity to the light vessel, are colored in a similar manner, and bear the letters LV with the initials of the station they mark. Buoys defining anchorage grounds are painted white, except those used for such purposes at a quarantine station, in which case they are painted yellow.

To assist further in distinguishing them, the ordinary unlighted buoys are made in two principal shapes in the portions showing above the water line: Nun buoys, conical in pattern with pointed tops, and can buoys, cylinder shaped with flat tops. When placed on the sides of channels, nun buoys, properly colored and numbered, are placed on the starboard or right-hand side going in from sea, and can buoys on the port or left-hand side. The numbers and letters placed on all buoys are formed by standard stencils, to insure uniformity, and the largest size practicable is used so that these may show as prominently as possible. White characters are painted on black buoys and black characters on red buoys.

Buoys are anchored in their positions by various types of moorings, depending on the character of the bottom and the size and importance of the buoy. They are placed in position and cared for by the lighthouse tenders, which are provided with specially designed derricks and lifting gear for handling them. It is customary to replace all buoys at least once a year for overhauling, repairing, cleaning and painting, and oftener when circumstances render it necessary. Although among the most useful of aids to navigation, buoys are liable to be carried away, dragged, capsized, or sunk, as a result of ice or storm action, collision, and other accidents, and therefore may not be regarded as absolutely reliable at all times. Great effort is made, however, to maintain them on station in an efficient condition, which frequently requires strenuous and hazardous exertions on the part of the vessels charged with this duty. It is necessary to keep an ample supply of spare or relief buoys, with the necessary appendages, always on hand to provide for emergencies, and the systematic relieving of buoys on station.

Buoys may be divided broadly into two general classes, lighted and unlighted, of which the latter are in the great majority. Unlighted buoys comprise spars, both wooden and iron, can, nun, bell and whistling buoys, with a few other types for special purposes. Lighted buoys are provided with some form of gas apparatus and a lantern; frequently a bell or whistle is also attached, in which case they are known as combination buoys. A brief description of each kind follows:

Wooden spar buoys are usually cedar, juniper, or spruce logs,

(*Continued on page* 96)

Advertising Index will be found on page 126

"CONSOLIDATED"

Runabouts

ARE designed and built for reliability and service.

When you mention "Consolidated built"—it identifies you with the finest craft that can be produced.

We have a limited number of runabouts in stock—immediate delivery.

Write for descriptive literature.

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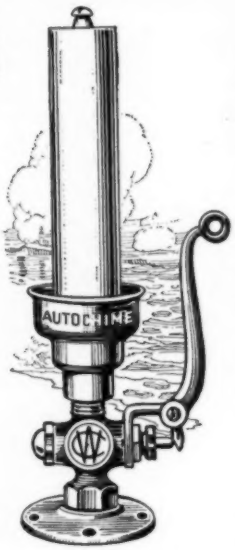
SHIPBUILDING CORPORATION

MORRIS HEIGHTS, NEW YORK CITY

AUTOCHIME

A Deep-Toned Musical Whistle For Air or Burned Gas Pressure

TUNED to first, third and fifth notes of the scale. One of the sweetest-toned, yet most powerful whistles made. Its deep, musical notes are blended and intensified by the megaphone effect of the patented cup-shaped bell surrounding the sound openings. Blows easily at low pressure. Look for name AUTOCHIME and *WC* trade-mark on bell. Buy from your dealer. He can fit you out complete with AUTOCHIME, *WC* Whistle Valves and special fittings for attaching Whistle to smoke stack or deck.



One of the 1001 WC Products

Get This Book of Helpful Hints for Motor Boaters

"Sea Craft Suggestions and Supplies" solves those daily "puzzlers" that few know how to handle. Tells how to Box the Compass; what is Proper Ground Tackle; gives hints on Steering Gear, etc.; describes WC Dependable Marine Hardware; tells uses. Compiled from 70 years' experience in making marine fittings. Sent prepaid for 50c.

WILCOX CRITTENDEN & CO., Inc.

ESTABLISHED 1847

4 South Main Street **Middletown, Conn.**

Advertising Index will be found on page 126

KERMATH

HERE'S HACKER'S NEW 21 FOOT SPECIAL!

Famous Builder of the "Adieu" Standardizes on a "V" Type Popular Size Runabout Boat

JOHN L. HACKER, famous Detroit architect and builder of the "Adieu", which recently won the Fisher trophy series of races at Miami, is now standardizing on a new popular size runabout boat—the "Hacker 21 foot special."

In Hacker's new 21 foot special boatmen can now get the much desired speed, true comfort and economy.

Built along exceptionally beautiful lines, with only the best of materials used—it is truly a boat for any sportsman to be proud of.

And under a standardized production basis this boat, completely equipped even to Bosch electric lighting and starting sells for only $1975. Formerly a special built boat of this type would cost nearly double this amount.

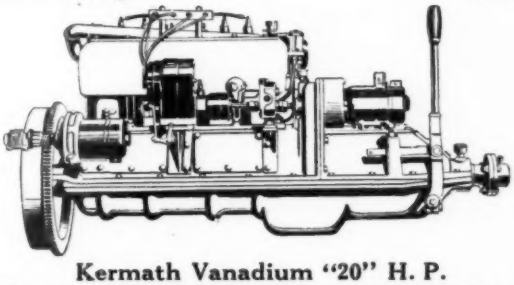
The Central Marine Service Corporation, Vinton Building, Detroit, Michigan, have been appointed as exclusive selling agents.

Mr. Hacker has made this arrangement in order that he might devote his whole time to rapid production of this 21 foot runabout, thereby making possible the low price.

In order to really appreciate this boat you must see it. Write now for literature which describes the boat in detail. Address all inquiries to

The Central Marine Service Corporation
Vinton Building **DETROIT**

"A Kermath Always Runs"



Kermath Vanadium "20" H. P.

A Kermath vanadium 20 H.P. with Bosch electric starting and lighting after many tests was selected by Mr. Hacker as *the one and only* suitable engine to power his new 21-foot special.
This engine will give the boat a speed of from 18 to 20 miles per hour.
Kermath engines are built in sizes from 4 to 40 H.P. Write for our interesting free catalogue, address Dept. "D".

KERMATH M'f'g Co.
DETROIT MICHIGAN.

The Great 2-CYLINDER KOBAN ROWBOAT MOTOR

For a summer of real outdoor delights, a Koban is indispensable. It takes you where you will, and when you will, with no back-breaking rowing to mar the pleasure of your trip.

The Koban will "run circles" around any other rowboat motor on the lake or river.

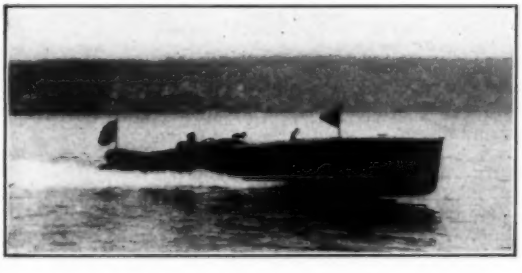
The **two cylinders** fire at the same time, neutralizing the shock. Only by this 2-cylinder opposed construction can you avoid the vibration that makes riding disagreeable, opens seams and ruins rowboats. Special tilting device, for shallow water and beaching.

Does Not Shake the Boat

Write for catalog and full information. Dealers and local agents wanted.

Koban Manufacturing Co.
246 SO. WATER ST. MILWAUKEE, WIS., U. S. A.

The first 2-cylinder rowboat motor—the standard of its type—not an experiment.



Huff, Daland & Company

announce the completion of their facilities for the production of high grade

Motor Boats and Flying Boats

Mr. Joseph Leyare, well known among boat owners as the proprietor of the former Leyare Boat Works of Ogdensburg, has been retained as designer and superintendent of the motor boat department.

The personnel of this organization combines experienced administrative officers and boat builders of unusual skill.

Let us figure on your 1921 boat.

HUFF, DALAND & COMPANY, Incorporated
OGDENSBURG, NEW YORK

Motor Boats Flying Boats Airplanes

Buoys, What They Mean and How to Use Them

(*Continued from page 92*)

trimmed, shaped, and provided with an iron strap and band at the lower end for attaching the mooring, which is as a rule a heavy stone or concrete block, or iron sinker, sometimes shackled directly to the buoy, or to a short piece of chain, as required by the depth. Such buoys are among the most economical and generally used of all aids, and are particularly employed in rivers and harbors. They are, however, easily damaged by ice or collision, and in some waters suffer greatly from the attacks of the teredo and other marine borers, although this may be reduced by special paints or other protective treatment when not unduly expensive. Four sizes or classes are in use, varying in length from 50 to 20 feet over all, to conform properly to the depth of water at the position of the buoy. The weights of such buoys vary from 1,500 to 350 pounds each.

Iron spar buoys are built up of iron or steel plates in the form of wooden spars, and are particularly valuable where severe ice conditions exist, or where the teredo is unusually active. They are naturally more expensive and heavier to handle, thus restricting their use to special localities. They are made in three classes, in lengths of from 50 to 30 feet over all, weighing from 4,000 to 2,000 pounds, respectively.

Cans and nuns, as already noted, are built of iron or steel plates, the former showing a cylindrical and the latter a conical top, and are the most extensively used of metal buoys. The interior of the buoys is divided into two or more compartments, by bulkheads or diaphragms, to prevent sinking when damaged. Each kind is built in three classes or sizes, and in addition two general types are in use, the ordinary type and the tall type, or channel buoys; the latter being a modern development of a larger and more prominent buoy for use in deeper water. These buoys weigh from 8,300 to 700 pounds each, according to size, and are generally moored by means of a stone or concrete block, or a specially designed hemispherical cast-iron sinker, shackled on a length of chain about two or three times the depth of water in which the buoy is placed. The ordinary type buoys commonly require a cast-iron ballast ball attached directly below the buoy, the mooring chain being shackled in turn to the lower end of the ballast ball; this is necessary to assist the buoy in maintaining an upright position, regardless of tidal or other currents. The ballast ball is not needed with the tall type buoy, which has more stability, due to its greater draft and to a fixed counterweight of cast iron bolted on its lower end. To prevent kinking or twisting of the chain, a swivel is occasionally placed in the mooring chain for all types.

Bell buoys have a hemispherical-shaped hull, built of steel plates, with flat deck, and carry a structural-steel superstructure which supports a bronze bell and usually four iron clappers. The motion of the buoy in the sea causes these clappers to strike the bell, so that the action is entirely automatic. Although the buoy is quite sensitive and responds to even a very slight motion of the waves, the sound may be faint or absent in unusual calms. This type of buoy is especially efficient in harbors or inside waters for marking points where a sound signal is desired. Bell buoys weigh about 6,900 pounds each, complete, and are moored by means of a bridle of chain attached to lugs on the opposite sides of the hull near the water line, the main mooring being shackled to the middle and lowermost part of the bridle and extending in the customary scope of chain with a swivel, to a heavy cast-iron sinker on the bottom. A large-sized ballast ball is shackled to a mooring eye at the bottom of the buoy, and the whole effect of this arrangement is to assist in the pendular motion necessary for ringing the bell.

Whistling buoys are built of steel plates, and consist of a pear-shaped body with the smaller end uppermost, with a long open tube on the lower end. This tube extends throughout the length of the buoy, and is closed at the upper end by a headplate on which is mounted a check valve and a whistle on the superstructure of the buoy. The sound is produced by the air in the upper portion of the tube being compressed by the falling of the buoy in the waves, its means of escape being through the whistle. A fresh supply of air is drawn through the check valve as the buoy rises again. Like the bell buoy, the sound is automatic, depending solely on the motion of the waves, and therefore the whistle may be silent when the sea is very smooth. The whistling buoy is most efficient in rough outside waters, where a ground swell exists, and is employed for important points where a sound signal is considered desirable. It is generally moored with a single chain of the proper scope and a heavy iron sinker. The weight of the buoy is about 6,500 pounds. For great depths, where the necessary quantity of chain impedes the flotation of the ordinary size of this buoy, a special and larger size is in use similar to the regular size in design and operation but weighing about 11,000 pounds.

Lighted buoys are a modern invention, having come into use within about the last 30 years, and are considered by mariners generally as among the most valuable of recent developments

(*Continued on page 122*)

Supply Stations for Socony Gasoline *and* Socony Polarine Oils *and* Greases

The sign of a reliable dealer, and the world's best Gasoline

The Standard Oil Company of New York operates directly at all points except where other representatives are listed.

NEW YORK BAY AND STATEN ISLAND

Bond and 1st Sts., Bklyn. — Gowanus Canal; S. O. Co. of N. Y.
Ulmer Park Pier — A. L. Anderson
Ft. 69th St., So. Bklyn. — C. Poling
Port Richmond, S. I. — S. O. Co. of N. Y.
Tottenville, S. I. — S. O. Co. of N. Y.
Stapleton, S. I. — Barge No. 30; Capt. Cattermole

EAST RIVER

Ft. N. 10th St., Bklyn.; Ft. E. 10th St., N. Y. C.; Ft. E. 120th St., N. Y. C. — S. O. Co of N. Y.
Ft. E. 23rd St., N. Y. City, (The Anna Service)
Ft. Walnut Ave., Bronx Kills, N. Y. — John Rehm

LONG ISLAND SOUND

Clason Point, Bronx — C. F. Quinn
City Island, N. Y. — Robert Jacobs; Grant & Fermel; J. Vidal; B. F. Wood
Port Chester, N. Y. — J. Kapp
College Point, L. I. — W. Needham; F. & W. Kraemer
Beechhurst, L. I. — Beechhurst Country & Yacht Club
Port Washington, L. I. — H. Berg
Glenwood Landing, L. I. — James Fyfe
Larchmont, N. Y. — Larchmont Yacht Club
Mamaroneck, N. Y. — Sound Mach. Shop
New Rochelle, N. Y. — Albert Lyon
Oyster Bay — Capt. Seaman
Cold Sp'g Harbor, L. I. — E. Abrams & Son
Huntington, L. I. — Wheeler Shipb'ld'g Co.
Port Jefferson, L. I. — Pt. Jefferson Marine Ry. Corp.
Greenport, L. I. — W. W. Griffin; G. Frank Tuthill
Fisher's Island, L. I. — A. H. Eldredge; Fishers Island Farms, Inc.
Rye, N. Y. — Amer. Yacht Club
Shelter Island, N. Y. — N. P. Dickerson

CONNECTICUT

Greenwich, Rowayton, New Haven, Groton, Saybrook, So. Norwalk, Stony Creek, Noank, Stonington, Stamford, Bridgeport, New London, Mystic

LONG ISLAND—SOUTH SHORE

Sheepshead Bay — W. Lang
Rockaway Point — P. H. Reid
Flatlands Bay — Chas. Morse
Canarsie (Barge 60) — Wm. Moran
West Sayville — F. Ockers
Patchogue — W. R. Marran
Montauk — E. B. Tuthill
Freeport, L. I. — J. Carcich
East Rockaway, L. I. — S. S. Rhame
Bayshore, L. I. — T. F. Muncy & Son
Amityville, L. I. — W. J. Ketcham

HUDSON RIVER

Yonkers, N. Y. — S. O. Co. of N. Y.; Corinthian Yacht Club; Riverside Pavilion
W. 140th St., N. Y. City, F. R. Welch
Tarrytown, N. Y., Tarrytown Boat Club
Nyack, Highland Falls, Cornwall, Newburgh, New Hamburg, Cheviot, Poughkeepsie, Kingston (Rondout), Saugerties, Greendale, Catskill, Hudson, Newton Hook, Stuyvesant, Van Rensselaer Is., Green Island
Coxsackie, P. V. Washburn & Son
Van Rensselaer Island Creek, Capt. Godfrey Smith
Coeymans — Wm. Stilman
Rensselaer — Bailey & Parker
Albany — Albany Yacht Club

BARGE CANAL—ERIE CANAL DIVISION

Schenectady, Scotia, Amsterdam, Little Falls, Utica, Rome, Syracuse, Rochester, Brockport, Albion, Geneva, Medina, Middleport, Lockport, Tonawanda, Buffalo, Seneca Falls

BARGE CANAL—OSWEGO CANAL DIVISION

Fulton

BARGE CANAL—CHAMPLAIN DIVISION

Fort Edward, Whitehall, Waterford, Mechanicsville, Stillwater, Schuylerville, Fort Miller, Smiths Basin, Fort Ann, Comstock

LAKE GEORGE

Caldwell, The Hague, Ticonderoga, Sabbath Day P't, Cleverdale, Lake George, Pilot Knob, Kaatskill Bay, Silver Bay

THE ADIRONDACKS

Saranac Lake, Tupper Lake, Blue Mt. Lake, Long Lake, Inlet, Lake Placid, Eagle Bay, Old Forge, Raquette Lake

LAKE CHAMPLAIN

Plattsburg, Westport, Port Henry, Isle La Motte Sta'n, Vt.; Orwell, Vt.; Highgate Springs, Vt.; Allburg, Vt.; Maquam Bay, Vt.; Chazy Landing Maquan, Vt.; Rouses Point, Ticonderoga, Essex, Grand Isle, Vt.; Swanton, Vt.; Allburg Springs, Vt.; Whitehall, Burlington, Vt.; No. Hero, Vt.; So. Hero, Vt.; Milton, Vt.; St. Albans, Vt.; Vergennes, Vt.

ST. LAWRENCE RIVER

Cape Vincent, Thousand Is'd P'k, Chippewa Bay, Clayton, Alexandria Bay, Grindstone Is'd, Ogdensburg, Fine View, Point Vivian
Morristown. — J. L. Smithers; Crawford & Co., Inc
Waddington — W. J. Shinn
On the St. Lawrence River our own launch makes deliveries to storage tanks at summer homes along the river. Headquarters of launch at Clayton, N. Y.

LAKE ONTARIO

Carlton, Sodus Point, Sea Breeze, Sackett Harbor, Summerville, Point Pleasant, Manitou Beach, Newport, Charlotte, Oswego, Henderson Harbor

NIAGARA RIVER

Tonawanda, Buffalo (foot Erie Street), North Tonawanda

LAKE ERIE

Buffalo, Dunkirk

NEW YORK STATE

Auburn — On Owasco Lake
Cayuga — On Cayuga Lake
Ithaca, on Cayuga Lake — W. A. Murray; Curless Co.; F. E. Johnson
Watkins, on Seneca Lake — F. D. Fordham; Watkins Garage; Smith & Rapalee; D. M. Reynolds; A. B. Ladd
Geneva, on Seneca Lake
Dresden, on Seneca Lake — J. L. Sweigart; F. H. Remer
Glenora, on Seneca Lake, M. D. Marks
Penn Yan, on Keuka Lake — M. J. Gavin; E. L. Geer; P. Costello & Son; Chalmer & Ingram; Ludbrooke, Perry & Andrus
Skaneateles — On Skaneateles Lake
Bluff Point on Keuka Lake, H. E. Whitney
Branchport, on Keuka Lake — Burtch Bros.; E. L. Parker Co.
Keuka, on Keuka Lake, Mrs. Bessie Young
Raquette Lake, on Raquette Lake, Dennis Dillon
South Bay, A. A. Morse; Sylvan Beach, E.E. Campbell; Constantia, Coble & Tanner; Bernhard's Bay, E. E. Dickinson; Cleveland, Cleveland Motor Car Co. — on Oneida Lake.
Montour Falls on Seneca Canal, F. L. Mallory

MASSACHUSETTS

Dorchester, East Boston, Falmouth, Gloucester, Hyannis, New Bedford, Newburyport, Provincetown, Vineyard Haven
Chatham — A. H. Bearse
Amesbury — Monomac Yacht Club
Annisquam — Chard & Wilkinson
Conomo Pt., Essex — F. M. Lewis
Fall River (foot Taylor St.), C. B. Austin
Haverhill — J. L. Moore
Manchester, Manchester Yacht Club
Marblehead — Corinthian Yacht Club; Marblehead Trans. Co.
Monument Beach — R. Bigelow
Nantucket — Island Service Co.; J. Killen & Co.
Onset — A. J. Record; J. T. Bishop
Provincetown — Frank Crawley; Cabral Bros.
Quincy — Baker Yacht Basin, Inc.
Rockport — Cape Supply Co.
Sandwich, Canal Fish & Freez. Co.
So. Dighton — Geo. Phillips
Taunton — Verdo Westgate
Wellfleet — F. T. Organ; J. G. Curran
Woods Hole — Penzance Garage

MAINE

Bar Harbor, Bath, Belfast, Boothbay Harbor, Eastport, Jonesport, Kennebunkport, Portland, Rockland, Stonington
Andrews Island (P. O. Rockland) — A. F. Racliff
Atlantic — A. C. Smith
Bailey's Island — E. E. Sennett
Bar Harbor — Fifield & Joy
Bass Harbor — N. E. Thurston; William Underwood Co.; A. D. Moore; H. R. Abel
Bay Point — Spinney Bros.
Beals — C. H. Beals
Bernard — Guy H. Parker; Willis Watson
Brooklin — Farnsworth Pckg. Co.
Camden — P. G. Willey & Co.; M. W. Ingraham; Marine Supply Co.; Camden Yacht Bldg. and Rwy. Co.
Castine — J. M. Dennett; W. H. Hooper's Garage and Machine Shop; J. M. Vogel
Christmas Cove, W. P. Macfarland
Corea — Roy D. Steward
Cranberry Isles — W. D. Stanley; C. E. Spurling
Dark Harbor — E. B. Williams
East Boothbay — Frank C. Adams
Five Islands — A. P. Reed
Frenchboro — F. W. Ross
Friendship — Jameson & Wotten
Isle au Haut — J. T. Conley
Isleford — Walter Hadlock
Jonesport (West) — F. P. Smith & Co.; J. W. Lamson
Jonesport — The Mansfield Co.
Kittery Point — Frisbee Bros.
Manset — John L. Stanley & Sons; W. H. Ward
Matinicus — Henry Young & Co.
Medomak — M. A. Simmons
Monhegan Island — D. M. Davis
Newcastle
New Harbor — S. Tibbets
Northeast Harbor, W. G. & L. F. Stanley
North Haven — W. S. Hopkins; S. F. Waterman Co.
Orrs Island — S. J. Prince & Son
Owls Head — M. T. Jameson & Son
Pemaquid Beach — Geo. R. McLean
Pleasant Point — W. J. Morse
Port Clyde — Geo. Brown
Prospect Harbor, J. W. Stinson & Son
Robinhood — Williams & Brilmayer
Sargentville — W. G. Sargent & Co.
Seal Harbor, Seal Harbor Fish Co.
South Bluehill — Sylvester Packing Co.; B. E. Sylvester, Jr.
South Bristol — E. T. Thompson
South Brooksville — R. C. Gray
South Freeport — L. A. Dickson
Southport — Ralph Thompson
Southwest Harbor — A. E. Parker; S. H. Mayo
Spruce Head — Charles Burke; Leslie Thompson
Swan's Island — East Coast Fisheries Co.; H. A. Johnson; S. Morse & Son
Tenants Harbor — L. E. Joyce
Thomaston — Dunn & Elliott
Vinalhaven — A. B. Arey
West Small Point — H. Smith

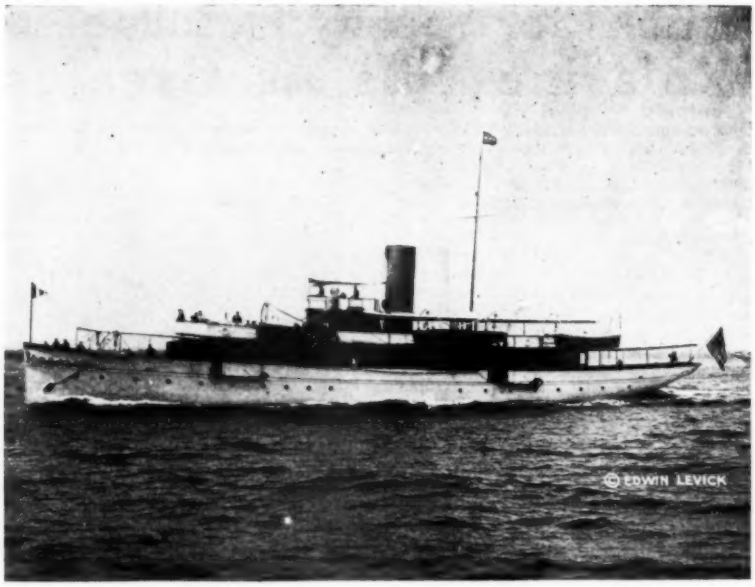
NEW HAMPSHIRE

Lakeport (Lake Winnipesaukee), Portsmouth
Wolfeboro-Goodhue & Hawkins

RHODE ISLAND

Newport, East Providence, Warren, East Greenwich, Wickford
Block Island — R. I. Fish Co.; G. P. Dunn, Jr.
Narragansett Pier, J. C. Tucker Co.
Oakland Beach — S. H. Stearns
Pawtuxet — John McLeod
Pt. Judith Breachway, Saml. Wright
Seaconnet Point — C. R. Gray; Est. C. R. Wilbur
Watch Hill — A. G. Stillman

NEW YORK ALBANY **STANDARD OIL COMPANY OF NEW YORK** BUFFALO BOSTON



S. S. Christina, renamed Arcturus, designed for F. C. Fletcher by Gielow & Orr. Built at Tebo's Yacht Basin (now Todd Shipyards Corp.). Equipped with Clothel Refrigeration.

The Clothel Provides Safe, Certain Refrigeration Without Ice

It has been demonstrating its efficiency on yachts and large motor boats for years.

It is giving equal satisfaction in many city and suburban homes.

The Clothel provides a dry, below-freezing coldness that is maintained continuously, regardless of weather and outside temperature changes.

And the domestic type will do it all automatically.

It is fine-looking, durably constructed and compactly designed though with ample food storage space.

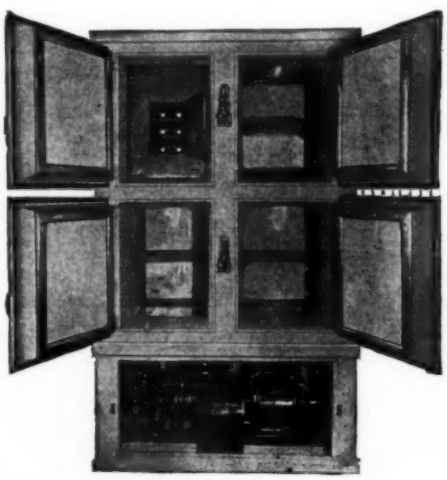
It does its work economically, and can be used wherever there is electric current.

Write for the Clothel Booklet and learn the whole story. No obligation.

The Clothel Refrigerating Company

61 Broadway, New York

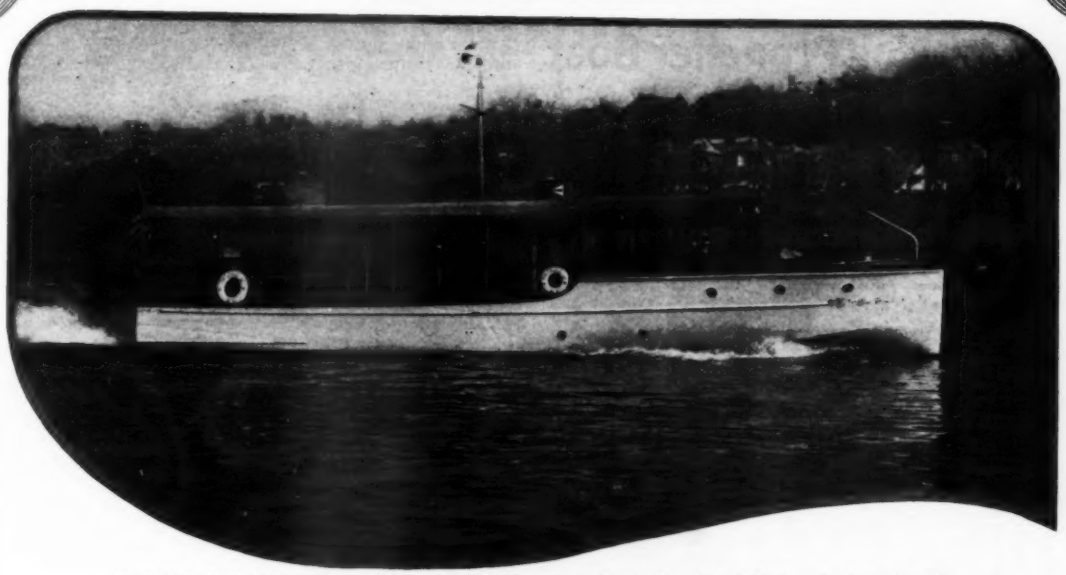
17 St. John St., Montreal, Canada



The smaller of two sizes of Clothel Electrical Refrigerators for home use.

Advertising Index will be found on page 126

MAKERS OF FINE YACHTS.



ORIANA II—53'-0" x 12'-6" x 3'-3". Built by New York Yacht, Launch and Engine Company for Mr. Arthur T. Murray, President of the American Bosch Magneto Company

The 20th Century

equipped boats still lead for Quality.

Twenty years of **satisfied** owners have proved the excellence of our Products.

Our boats and motors are worthy of your investigation. They are backed by experience and knowledge of how best to design and construct. The pleasure we take in planning your new yacht will be multiplied and continue to increase as you use the finished craft. We shall be glad to place our organization at your disposal.

Two 85' x 19' House Yachts

Two 73' x 17' House Yachts

One 108' x 12' Cruising Yacht
One 100' x 16' Cruising Yacht
in addition to various types of speed runabouts.

We manufacture the celebrated 20th CENTURY MOTORS

400 to 500 R. P. M.
Heavy duty type

2 cyl., 15-20 B. H. P.
4 cyl., 40-50 B. H. P.
6 cyl., 65-75 B. H. P.

All motors 6½" bore x 8½" stroke, 4 cycle

NEW YORK YACHT, LAUNCH & ENGINE CO.
BUILDERS
MORRIS HEIGHTS, NEW YORK CITY.

Rocks, Logs, Sand Bars

Have no terrors for the

Disappearing Propeller Boat

A safe seaworthy little craft that makes 9 or 9½ miles an hour and goes 20 to 25 miles on a gallon of gas. Takes you anywhere there is water enough to float a rowboat.

The protected propeller moves up into a well and automatically throttles down the engine if you strike a snag, or beach the boat. Midships propeller like a centerboard makes it unusually stable in a sea. The boat for lakes, rivers, creeks, harbors, bays—for campers, hunters, fishing, family use and summer homes.

Write today for catalog and prices

DISAPPEARING PROPELLER BOAT co

725 Main Street, Buffalo, N. Y.

North Tonawanda, N. Y. 92 King St., W., Toronto, Canada

ELASTIC SEAM-COMPOSITION TRADE MARK

Manufactured by H. B. Fred. Kuhls

Keep Your Decks Tight

Elastic Seam Composition remains elastic and flexible, adhering to the sides of the seams and yielding to the swelling and shrinking of same. It will last from eight to twelve years, keeping the decks tight and wearing down with the planking.

We would be pleased to submit estimate for caulking and filling of Decks, guaranteeing same for a period of years.

ELASTIC COMPOSITION AND REPAIR COMPANY

H. B. Fred. Kuhls, Manager

6411-23 Third Ave., Brooklyn, N. Y.

Yard and Shop

(*Continued from page 42*)

which is being built by the R. W. Harrison Boat Works, Toledo, Ohio. This little boat is particularly designed and built to meet the needs of the greatest number of people. Seaworthiness, comfort and economy are all combined in developing this boat and the resulting product is of superior quality and moderate price.

Submarine-Chaser Convention

All submarine-chaser men will be interested to learn that the Submarine-Chaser Club of America is to hold a convention in New York City on May 20, 21 and 22.

It is the purpose of the Submarine-Chaser Club to get together at this time as many of the ex-chaser men as possible, and to place them in touch with their former shipmates.

Entertainments will be arranged by the entertainment committee for the dates, and housing accommodation may be had free of charge to all Sub-Chaser Veterans, whether members of the Club or not, providing they will advise Headquarters of their intention of coming.

The Club hopes at this time to interest those men from centers other than New York in the forming of auxiliary clubs and will explain to them the Navy Department's offer to furnish chasers for their use. The Club is at present taking up the matter of securing a large yacht for Headquarters and several chasers for cruising.

The Club publishes the Log and the next copy will contain all the hot-stuff about the convention. Send for it and any other information you desire. It may be had from temporary Headquarters, Submarine-Chaser Club of America, 28 East 49th Street, New York City.

Remember, you do not have to be a member to come to the convention! And if you cannot come, send your address, somebody will want to know where you are.

Winslow Consulting Architect for Densmore Company

Ralph E. Winslow, Naval Architect, who has been engaged in Yacht and vessel designing for the past seventeen years, has opened an office at the yard of the J. M. Densmore Company, Atlantic, Mass. He will specialize in the design of high grade yachts and commercial vessels, and the supervision of their construction. Mr. Winslow has had extensive experience in yacht designing and has been connected with many of the most prominent yacht and shipbuilding companies.

Small Motor Boat Found

The United States Customs Service reports the following advice from France: A small motor boat bearing the inscription Isabella Harris, New York, was picked up at sea by a fisherman off the coat of Guilvinec, Finistere, France. The boat gave evidence of having remained in the water for some time, was covered with sea-weed, and the motor badly rusted. No information can be learned as to the vessel or crew. The Isabella Harris was sold by the French Inscription Maritime according to law, and a balance amounting to francs 2872.75 is held at the disposal of the owners.

Modern Upholstering

Exposure to sea air plays havoc with the upholstery of deck furniture, cabin or cockpit cushions. This damage can be reduced to a minimum by the selection of a proper material for coverings. Artificial leather product which fully meets all requirements of the hard service incident to marine use is made by the L. C. Chase Company, Boston, and marketed under the name of Chase Leatherwove. The durability of this material is such that any traces of dirt, mud or grind which may accumulate during service can be quickly removed with water and soap. Boat builders seeking proper upholstery equipment, particularly in line of cushions and pillows, should well consider this material as a possibility.

Barker Motors Now Have Philadelphia Agency

Extending its service and sales organization for Barker Motors and parts to the Philadelphia territory, the Barker factory of Norwalk, Conn., has now added the name of Kean, Sharon & Co. to its list of distributing agents. The manufacturers of Barker Motors have long followed the practice of dealing directly with the motor boat owners in all localities until they found agents or dealers in whom the boatmen as well as the manufacturers could place implicit confidence. Under this custom the New York territory was placed in the hands of Topping Brothers, and later the distribution in the Boston territory was given the Toppan Boat Mfg. Co.

Advertising Index will be found on page 126

Here Is Ole Evinrude's New Motor

OLE EVINRUDE, the man who made possible the outboard or detachable rowboat motor, again is receiving enthusiastic expressions of appreciation from old friends and new everywhere as a result of the announcement of his new Light Twin Outboard Motor now being manufactured by the Elto Outboard Motor Co., of which he is President.

As a fellow sportsman and master engineer, it therefore pleases him much to present the **ELTO,** ideal motor for sportsmen and all outdoor people.

The **ELTO** motor in structure and finish is distinctly different from all of Mr. Evinrude's earlier models. Its highly polished aluminum and nickeled parts identify it in appearance as the "silvery motor."

Its clever design has made possible a twin-cylinder motor, which, weighing but 46 pounds, develops full 3 H.P. Its sturdy and substantial construction suggests dependability and years of service.

Free from vibration, because of its perfect mechanical balance—quiet and smooth with not a particle of back pressure, the result of its new underwater exhaust principle—the **ELTO** motor stands alone for comfortable operation.

Its well-thought-out ignition — an Atwater Kent combination—has produced an easy, quick and positive starting. Its bracket arrangement allows it to be raised instantly and easily above the water line in dangerous or unusually shallow waters, and motor will tilt automatically when striking an obstruction, protecting both itself and boat from possible harm.

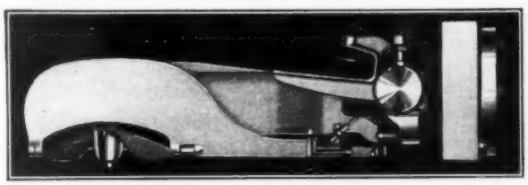
The propeller and housing design of the **ELTO** together with its splendid tilting arrangement, make it altogether weedless.

Its balanced method of steering gives freedom from the urgent necessity of holding constantly to the steering handle and after motor is shut off, control of the boat is still to be had by the use of the rudder.

Most noticeable are the clean-cut stream lines of its lower frame, free from unnecessary protrusions and forming the least resistance to the water; while its broad, smooth surface permits of easy cleaning. Its remarkable compactness for carrying is brought about by the rudder swinging back against main frame where it is securely caught. Its spark plugs, placed where they insure safety from shocks or breakage, is a point much to be appreciated.

Altogether, the **ELTO** motor is a strictly 1921 product and the best guarantee we can give of its excellence is the natural genius and big experience of its designer and builder, Ole Evinrude.

Truly, the **ELTO** Light Twin Outboard Motor is a skillful piece of mechanism of exceptional quality in every detail.



Weight 46 lbs. Dimensions 34" x 9¼" x 13¼" Folded
"Comfortably Portable."

Our Attractive Catalog Is Now Ready

ELTO OUTBOARD MOTOR CO.

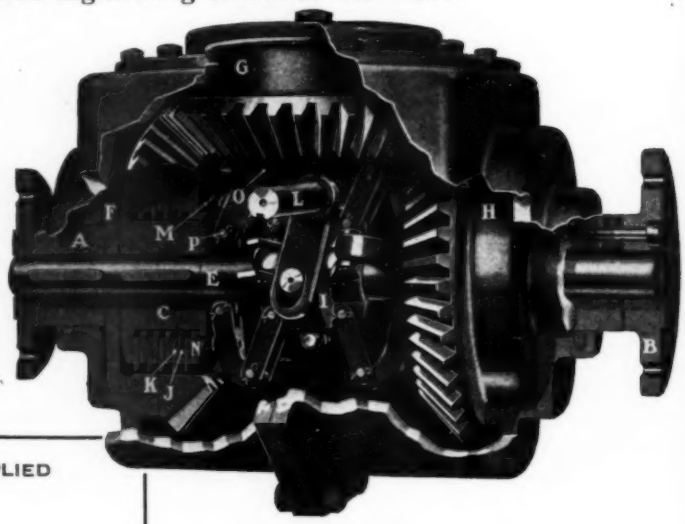
OLE EVINRUDE, President

MANUFACTURERS' HOME BLDG. Dept. F MILWAUKEE, WIS.

The Gear for Heavy Service
McKinnon Reverse Gear

IN our own commercial boat and in other boats under our direct observation, McKinnon Reverse Gears have for three years withstood severe service tests more successfully than any reverse gear we could buy. Not satisfied with service tests alone we submitted the McKinnon Gear to electric dynamometer tests at the Mechanical Laboratory of the Case School of Applied Science, the famous engineering school at Cleveland.

The McKinnon Gear can be run indefinitely on reverse at full speed and load, without injury to the gear. Engine builders have told us that 15 or 20 minutes on reverse at full engine speed will burn up any other gear they have tried.



CASE SCHOOL OF APPLIED SCIENCE
CLEVELAND, OHIO

DEPARTMENT OF MECHANICAL ENGINEERING

February 25th, 1921.

REPORT OF TEST—McKINNON MARINE REVERSE GEAR

The power was supplied to the clutch by means of a Sprague electric cradle dynamometer and the power delivered by the clutch was determined by means of a Prony brake. The speed of the dynamometer shaft and the clutch shaft was taken by speed counters and up to the maximum capacity of the clutch no slipping was noticed.

A table of results follows:

Reverse Gear No. 4

Revolutions Per Minute of Clutch Shaft	Horse Power Supplied to Clutch	Horse Power Delivered by Clutch	Friction Horse Power of Clutch	Mechanical Efficiency of Clutch Per Cent
100	20.70	20.5	0.20	99.2
200	41.48	41.0	0.48	98.8
300	62.32	61.5	0.82	98.6
400	83.25	82.0	1.25	98.5
500	104.23	102.5	1.73	98.3
600	125.29	123.0	2.29	98.1
700	146.43	143.5	2.93	98.0
800	167.73	164.0	3.73	97.8
900	189.32	184.5	4.82	97.5
1000	211.22	205.0	6.22	97.1

The friction horse power of the clutch was carefully checked with no brake on the delivery side of the clutch and proves conclusively the amount of power wasted in internal friction and that the mechanical efficiency of this clutch is remarkably good at all speeds up to 1000 r.p.m. when adjusted to carry the maximum loads given in the tables.

Friction tests were made with the clutch in reverse and without a brake, the results checking almost exactly those obtained with direct rotation. It is therefore safe to state that the clutch will transmit the same power in reverse as in direct rotation provided the adjustment is the same.

Respectfully submitted,
(Signed) F. H. Vose,
Professor of Mechanical Engineering.

The McKinnon Gear gives the same speed forward and reverse, and transmits full power in either direction. The mechanical efficiency is exceptionally high—the power loss exceptionally small.

This gear is built to stand hard use and abuse, with powerful engines and heavy boats, without trouble, repairs or adjustment. Operates in a bath of oil and has no small working parts to wear. Absolutely GUARANTEED FOR ONE YEAR.

Ready for delivery:
No. 3 transmits 13 H.P. per 100 R.P.M.
No. 4 transmits 20 H.P. per 100 R.P.M.

Ready May 15th
No. 1 transmits 4 H.P. per 100 R.P.M.
No. 2 transmits 8 H.P. per 100 R.P.M.

Write today for description and prices, giving details of your engine including R.P.M.

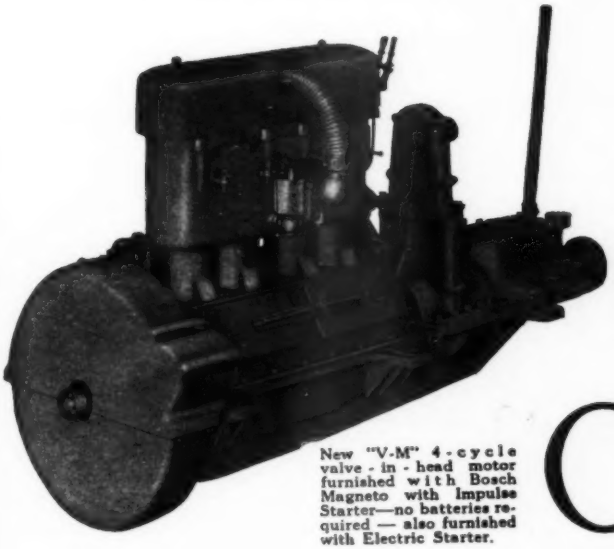
The McKinnon Iron Works Company

ASHTABULA *Established 1880* **OHIO**

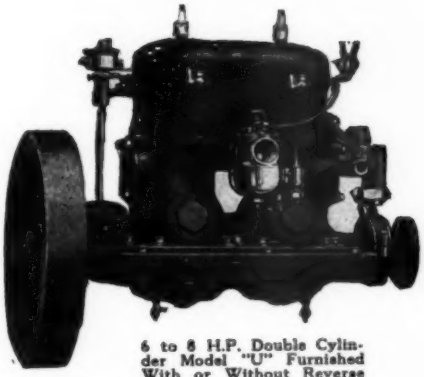
Advertising Index will be found on page 126

Gray Marine Motors for 1921

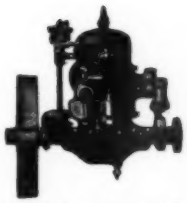
"the engine with the big crank shaft"



New "V-M" 4-cycle valve-in-head motor furnished with Bosch Magneto with Impulse Starter—no batteries required — also furnished with Electric Starter.



6 to 8 H.P. Double Cylinder Model "U" Furnished With or Without Reverse Gear



Selected for Canoes, Row Boats and Small Launches. 3-8 H.P. 2-cycle Gray Motor. Standard the World Over.

This new model V-M 4 cycle engine marks an epoch in Marine Motor History

OVERHEAD valve marine-motors are acknowledged to be of greater efficiency and power than other types and in the Gray the ultimate or valve-in-head marine motor perfection has been attained.

The Gray is designed to operate on either gasoline or kerosene, it cannot backfire, it burns the fuel keenly with practically no carbon, soot, smoke or odor and lubrication troubles are unheard of in the Gray.

Our Hot-Spot Cylinder Head gasifies thoroughly the fuel used and renders it completely combustible.

Gray Two-Cycle Motors are built in models from 3 to 8 h. p. Gray Four-Cycle Motors are built in three sizes, 10 to 50 h. p. Write for FREE catalog.

You can place your order now for shipment next spring or sooner, and should the price of labor or material be reduced, we will give you the benefit of the same.

By having your order on our books now, will guarantee delivery when you require your engine, and at the same time you are protected in price.

GRAY MOTOR COMPANY 2106 MACK AVE., Detroit, Mich.

Just Worlds of Fun

Think of the fun in skimming about over river and lake—to that sandy bathing beach—those far-off "fishing grounds"—to your favorite picnic nooks, or just exploring shore lines and rivers, and never touching a hand to oars or paddles. You, too, can have all this fun if you clamp a

CAILLE 5 Speed Motor

to the stern of your rowboat or canoe. It attaches in a jiffy by simply turning two thumbscrews. Has five speeds. Will drive your boat at 7 to 10 miles an hour or at trolling speed. You can also back your boat fast or slow. Or, you can run up to a pier and stop the boat without stopping the motor. The Caille Five-Speed Motor starts with a starter—no cranking. Has magneto built into flywheel and water-cooled muffler on exhaust. Battery ignition if desired. It's the finest rowboat motor in the world—made of best materials throughout and fully guaranteed. Its little brother—the

Liberty Drive
ROWBOAT MOTOR

is of the same high quality but of different design, and does not embody some of its big brother's features. It, too, attaches to any rowboat in a jiffy. Motor pivots in an up-and-down and sidewise movement. Speed adjustments secured by revolving handle on steering lever. Pressing button on end of lever stops motor. Goes through weeds like an eel. Excellent in shallow water. Send for catalog describing both motors. Address us or nearest distributor.

The Caille Perfection Motor Co., 45 Caille Bldg., Detroit, Mich.

G. H. Masten Co., 38 E. Ninth St., N.Y.
T. T. Burchfield Co., 604 Arch St., Philadelphia
Toledo Sales & Engine Co., 6 St. Clair St., Toledo
Gray Aldrich Co., 84 Atlantic Ave., Boston
Woodhouse-Schmitz Engine Co., 62 Marion St., Seattle
Standard Supply & Hardware Co., 822 Tchoupitoulas St., New Orleans
Burroughs-McMeekin Co., 30 E. Bay St., Jacksonville, Fla.
Unger & Mahon, Pratt & Gay Sts., Baltimore, Md.
William Grossman, 1630 Pine St., St. Louis
Perfection Motor Co., 390 St. James St., Montreal, Canada

The Caille Five-Speed Motor—the "Rolls-Royce" of all rowboat motors

Dealers

There's a Caille rowboat motor to meet every purse. All are nationally advertised and well known. Handle them. Send for dealers' proposition.

CAILLE
Rowboat Motors

Advertising Index will be found on page 126

CRANE
Plumbing Equipment

is of a quality consistent with the most exacting requirements of sanitation, and is designed for the utmost comfort and convenience of the user.

Above is illustrated a complete equipped bathroom, all the fixtures of which are earthenware, the lavatory and closet being Vitroware and the bathtub solid porcelain, which insures cleanliness at all times.

SALES OFFICES, WAREHOUSES AND SHOWROOMS:

BOSTON, SPRINGFIELD, HARTFORD, BRIDGEPORT, ROCHESTER, NEW YORK, HARLEM, ALBANY, BROOKLYN, PHILADELPHIA, READING, ATLANTIC CITY, NEWARK, CAMDEN, BALTIMORE, WASHINGTON, SYRACUSE, BUFFALO, SAVANNAH, ATLANTA, KNOXVILLE, BIRMINGHAM, MEMPHIS, LITTLE ROCK, MUSKOGEE, TULSA, OKLAHOMA CITY, WICHITA, ST. LOUIS, KANSAS CITY, TERRE HAUTE, CINCINNATI, INDIANAPOLIS, DETROIT, CHICAGO, ROCKFORD, OSHKOSH, GRAND RAPIDS, DAVENPORT, DES MOINES, OMAHA, SIOUX CITY, ST. PAUL, MINNEAPOLIS, WINONA, DULUTH, FARGO, WATERTOWN, ABERDEEN, GREAT FALLS, BILLINGS, SPOKANE, SEATTLE, TACOMA, PORTLAND, POCATELLO, SALT LAKE CITY, OGDEN, SACRAMENTO, OAKLAND, SAN FRANCISCO, LOS ANGELES

FOUNDED BY R. T. CRANE, 1855

CRANE CO.

836 S. MICHIGAN AVE.

CHICAGO

WORKS: CHICAGO AND BRIDGEPORT

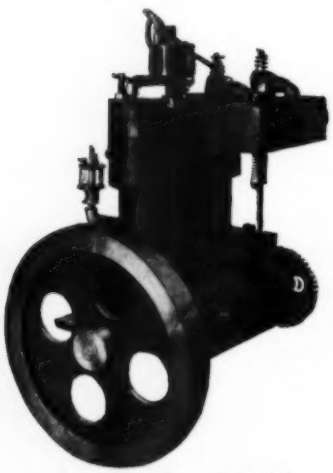
CRANE LIMITED — MONTREAL, TORONTO, VANCOUVER, WINNIPEG, CALGARY, REGINA, HALIFAX, OTTAWA, QUEBEC, HAMILTON, LONDON, ENG., BIRMINGHAM, ENG., MANCHESTER, ENG., SYDNEY, N. S. W.

We are manufacturers of about 20,000 articles, including valves, pipe fittings and steam specialties, made of brass, iron, ferrosteel, cast steel and forged steel, in all sizes, for all pressures and all purposes, and are distributors of pipe, heating and plumbing materials.

DUNN

The Lowest Priced Four Cycle Motors Made

Single Cylinder, 2 H. P.
Bore 3¾", Stroke 4"
$42.50



Two Cylinder, 4 H. P.
Bore 3¾", Stroke 4"
$75.00

Two Cylinder, 8 H.P.
Bore 4¼", Stroke 5"
$125.00

IF you want a genuine four cycle motor at the lowest possible cost, don't fail to investigate the Dunn Motors. They give you the undoubted advantages of four cycle design at a cost about the same or less than ordinary two cycle motors.

The low cost of Dunn Motors is due to their simplicity of design and construction. Our factory is located out of the high price belt and we put our money into materials and machine work instead of into big salaries and commissions.

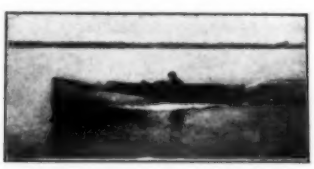
Dunn prices speak for themselves. They are just enough to cover essential materials and workmanship. There are just so many necessary working parts in an engine, and anything beyond this means unnecessary expense for the buyer.

Hundreds of Dunn Motors are in use and it is surprising how many testimonial letters we receive from satisfied users. Many a Dunn owner says he would not change engines for others of higher price.

WHAT A DUNN USER WRITES

"This is to certify that about 10 months ago, I purchased one 12 H.P. Dunn Motor which I had installed in my cabin cruiser, 33½ ft. long by 9 ft. beam, full model boat, and I use this boat in outing trips and have made as high as two hundred miles without a stop. It works beautifully, and my little boy, 13 years old, can and does start motor without any trouble. This motor runs smooth and easy, in fact, is as smooth running as any automobile I have ever used. I consider it the best marine engine made."

(Signed) DR. G. H. HOWARD.



A Dunn Powered Launch

DUNN MOTOR WORKS, Ogdensburg, N. Y., U. S. A.

Advertising Index will be found on page 126

MOTORS

Built for Service at the Lowest Possible Cost — Not for Looks

WHEN you buy a Dunn, you don't get a fancy engine but you get one that's worth the money.

Did you ever stop to think what makes some engines cost so much more than others? It is finish, extra workmanship, complicated design, and sometimes the tremendous "overhead" expense of a big factory.

In building Dunn Motors we have aimed to supply a satisfactory motor for the man who doesn't care for fancy finish but wants the most power and service for his money. If motor boating is ever to be popular as a sport or profitable as a business, it must have motors and boats at popular prices for the average man, as well as the expensive outfits for the wealthy buyer.

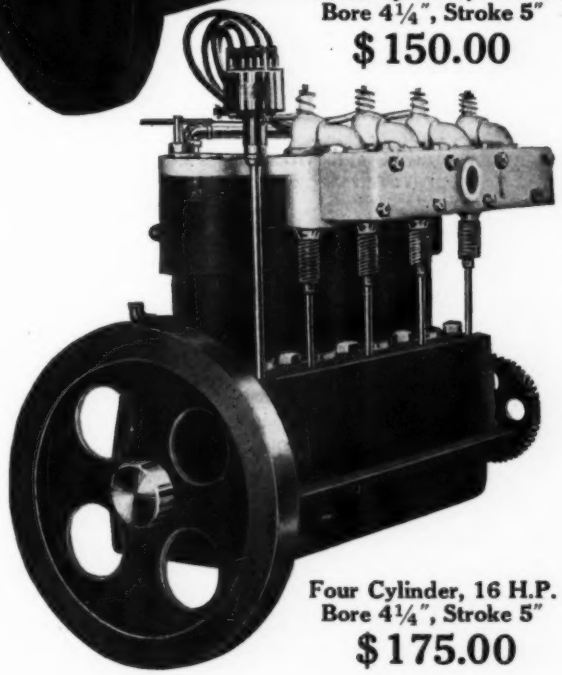
Some men can't change a spark plug without breaking something while some others can make any motor run like a watch. We believe the average man who buys a Dunn Motor gets more real enjoyment out of boating than the man whose only tool is a check book.

The prices quoted include complete equipment, propeller, shaft, couplings, coil, spark plugs, mixing valves and oil cups. Foreign buyers should add 10% to cover cost of boxing for export and delivery F. O. B. steamer at New York City.

Write today for catalog

Three Cylinder, 6 H.P.
Bore 3¾", Stroke 4"
$100.00

Three Cylinder, 12 H.P.
Bore 4¼", Stroke 5"
$150.00



Four Cylinder, 16 H.P.
Bore 4¼", Stroke 5"
$175.00

DUNN MOTOR WORKS, Ogdensburg, N. Y., U. S. A.

Columbian Bronze Propellers win at MIAMI

Webb Jay, owner of "Adieu" the Hacker designed and Hall-Scott powered Runabout which won the Fisher Trophy at Miami wired as follows:

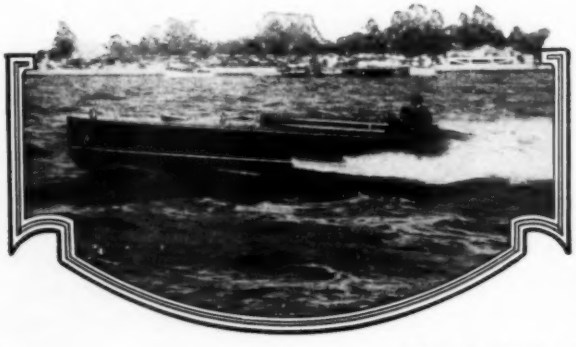
"Adieu used an Ailsa Craig Columbian Propeller in the races."

In the three strenuous heats of fifty miles apiece the Columbian Propeller on the "Adieu" delivered a 100% service and cooperated to the fullest extent in giving the boat that little extra speed needed to win the race.

But additional evidence, if that be needed, to prove our statement that a Columbian Bronze Propeller will make *your* boat a faster and better boat.

Write for the Columbian Propeller Catalog

COLUMBIAN BRONZE CORPORATION
522 Fifth Avenue New York City
For New York Local Sales Only:—44 Third Ave.



Diesel Engines for Commercial Boats

(*Continued from page* 32)

never economical to install a gas engine. The boat owner simply cannot afford to install a gas engine in any size where the oil engine is available.

There is another very important item in this connection which is not shown in the charts but should be brought out at this time, and that is the question of insurance. Most of these small commercial work boats are of wooden construction, and the insurance rates are high enough in any case, but with a gas engine and the presence of gasoline in large quantities with the attendant danger of fire, the insurance companies demand a higher rate of insurance than they do in the case of the oil-engined vessel. This omits, of course, the question of safety of the crew, but in a seagoing vessel this must not be ignored, and makes the case all the stronger for the oil engine. Both the hot-bulb and Diesel types of engine use a fuel of high enough flash point so that there is practically no danger of fire due to the presence of the fuel itself even with the most ordinary precautions. The hot-bulb engine has a slightly increased fire risk as compared with the Diesel engine on account of the use of open flames for heating the bulbs when preparing for a start, but this is not a serious risk even for these engines, and in some forms of hot-bulb engine, and all types of the Diesel engine, this is eliminated entirely. The question, then, comes down to a choice of a Diesel or hot-bulb engine.

The charts show that for 250 hr. or less yearly operation the Diesel engine cannot overcome the handicap of a large initial first cost with its superior fuel economy; for 1500-hr. operation per year there is very little to choose for 100-h.p. sizes and over, but as the number of hours of operation increases to 3000 the superior oil economy of the Diesel engine asserts itself and the Diesel engine has a decided advantage.

The curves do not show all of the advantages of the Diesel engine. As a matter of fact, the Diesel engine can use a wider variety of fuel than the hot-bulb engine, and more important, can use fuels of a heavier grade. With the present fuel situation, this is a factor that must not be overlooked because the present fuel outlook indicates that heavier grades of fuel will be more readily available in the future than the lighter grades, and with a Diesel engine installed the boat owner need not worry about the future in this respect; while with the hot-bulb engine there seems to be a possibility that in the future there may be such a scarcity of the lighter grades of fuel oil as to force the price upward. Another important point is the mechanical operation of the two types of engine in the various sizes. In sizes up to, roughly, 100 h.p., the hot-bulb engine is reported in a great many cases to have given eminent satisfaction as regards operation, but there are several cases on record in the larger sizes where the owners have had many difficulties. On the other hand, the Diesel engine while functioning perfectly in the small sizes is very expensive to build relatively, and does not show a marked superiority in cost of operation over the hot-bulb engine. When it comes to sizes of 100 h.p. and over, the superior mechanical performance of the Diesel engine and its advantage in cost of operation becomes more marked, and the larger the size of the engine the more advantage the Diesel engine has in these two respects. Along this line it is to be noted that certain makes of hot-bulb engine have added a small air compressor and changed the cycle of operation to more nearly that of a Diesel engine in the larger sizes.

The consumption of lubricating oil has not been figured into these curves, and it has been taken as the same for all of the types of engine of a given size. This is approximately true in considering the best types of hot-bulb engines working under the best of conditions, but since most engines of this type have crankcase compression and port scavenging of the working cylinder, the consumption of lubricating oil is likely to be very high unless the design of the engine provides for this contingency with special mechanical features which prevent undue leakage of oil from the bearings into the crankcase, and even with these added features they must be kept in the best mechanical condition. This means that the Diesel engine has as good a lubricating oil consumption as the hot-bulb engines under the best conditions, and under the worst conditions the Diesel engine has a decided advantage. In this connection it can be stated that a fair lubricating oil consumption for a Diesel engine is from one-fiftieth to one-seventy-fifth of the fuel oil consumption at full power.

The question of attendance is another item that has not been included, but this is more or less a constant for all sizes and types of engine under consideration. In boats of this type it is customary to carry only one engineer except in the case of large powers where the operation involves 24 hr. per day running. In the case of fishing schooners which have 100-h.p. and even in some that have 180-h.p. engines installed it is customary to carry only one engineer even though non-stop runs of 80 hr. are very common. Under these circumstances the engine has to take care of itself for periods of 4 and 5 hr. at a time while the

(*Continued on page* 114)

Advertising Index will be found on page 126

DIESEL ENGINES for PLEASURE YACHTS

IDEALIA, 84′ x 14′ x 3′, is powered with a 120 H.P. NELSECO Diesel engine which drives her 14¼ miles per hour, using only six gallons of fuel oil per hour. It would take 15 gallons of gasoline to produce the same power, *at approximately ten times the cost.*

Everyone concedes the advantages of Diesel engines for commercial boats. The case of Idealia and other successful installations prove that NELSECO engines are equally suitable for substantial pleasure yachts and large cruisers.

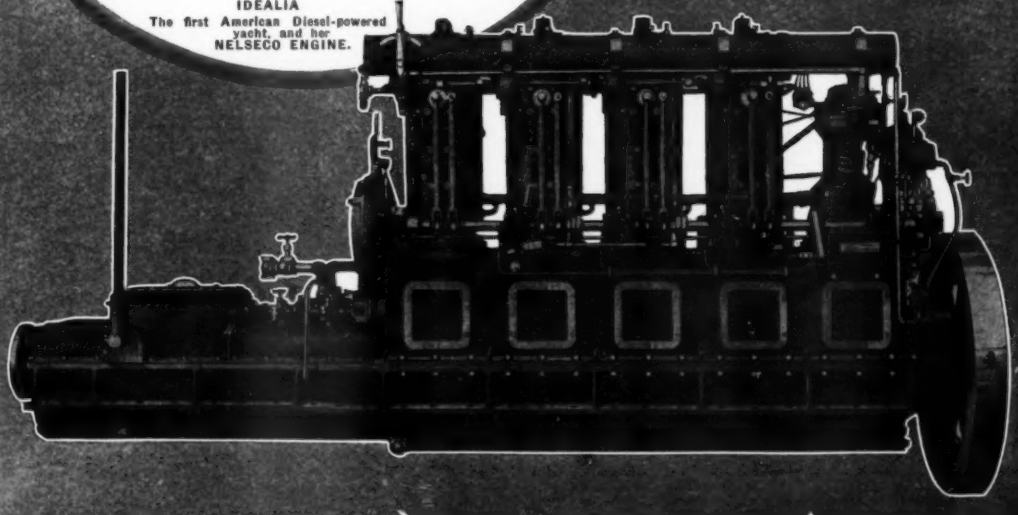
The broad experience of this company, the first to build a Diesel Engine in America for marine use, is at the disposal of those who are interested in investigating or planning a Diesel powered boat. Our engineers will take pleasure in working out your power problem if you will put it up to them. 120 B.H.P. to 3400 I.H.P.—over 150,000 B.H.P. in use or on order.

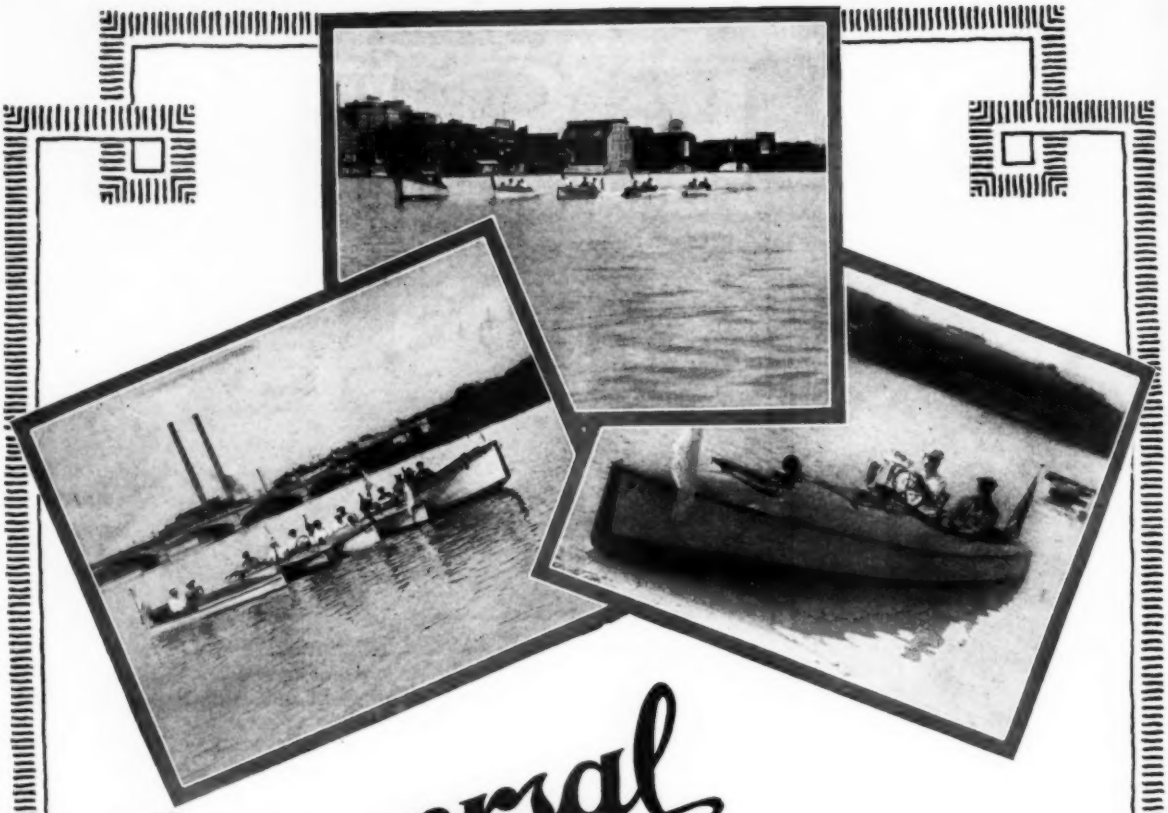
Let us send you complete information. Give us the details of your boat.

THE NEW LONDON SHIP & ENGINE COMPANY
Groton, Conn., U. S. A.

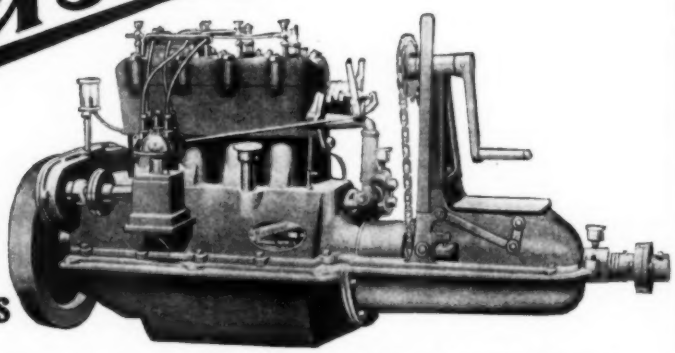
Pacific Coast Office: 402 Exposition Bldg., San Francisco, Calif.

IDEALIA
The first American Diesel-powered yacht, and her NELSECO ENGINE.



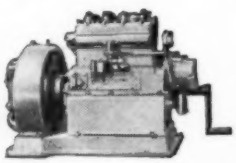


Universal



4 Cylinder Marine Motors

give motorists that feeling of security that comes from the knowledge of having dependable power at their command. That Universal Motors give universal satisfaction is attested by the fact that whenever a Universal is shipped to any locality, others soon follow. The illustrations above show views of a number of Universal equipped boats at Waterloo. Similar group installations can be found on any navigable waterway in the United States, Canada, Mexico, South America, Europe and the Orient. Investigate the Universal and you will specify it for your boat. Send for Bulletin No. 29.



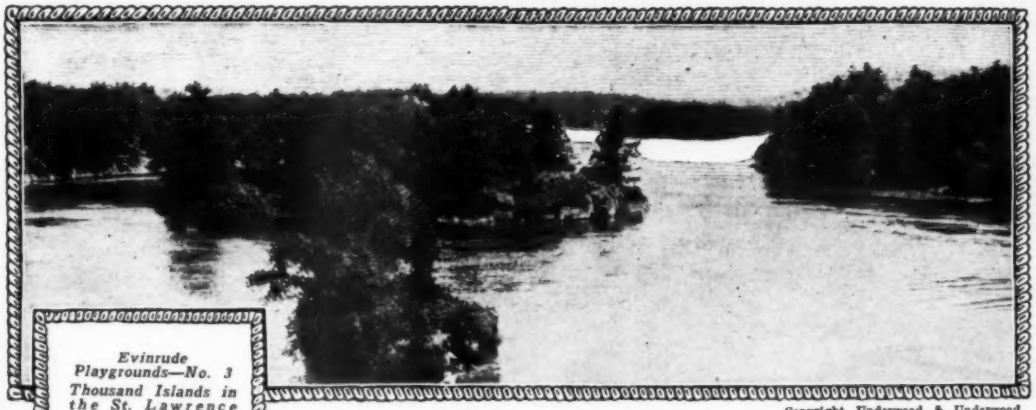
4 K. W. Generating Sets

driven by Universal 4 cylinder motors are used the world over for lighting Pleasure Yachts, Summer Colonies, Small Towns, Theatres, Circuses, Fairs, Churches, Schools and Farms. They are the choice of discriminating buyers. Write for Bulletin No. 30.

Universal Motor Co., Oshkosh, Wisconsin

Not connected in any way with any other company using the name "Universal."

Advertising Index will be found on page 126



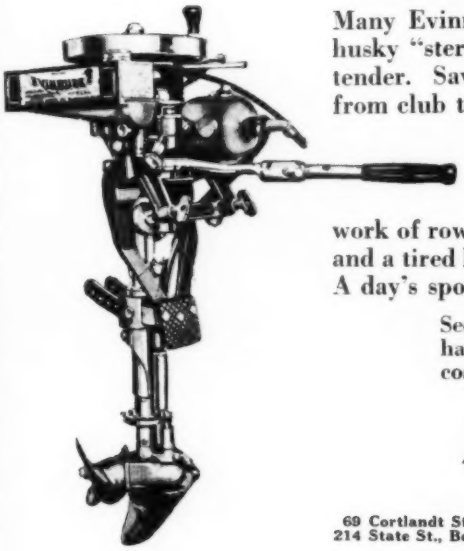
Evinrude Playgrounds—No. 3 Thousand Islands in the St. Lawrence River—a famous resort country where scores of Evinrudes are in use every season.

Copyright Underwood & Underwood

A Penny a Mile

BREEZING over the water with a husky little motor to supply the power! 25 to 30 miles to a gallon of gas—no expensive repairs—no need for a boathouse. Is it any wonder that 120,000 enthusiastic sport-lovers swear by the Evinrude?

Many Evinrudes are owned by yachtsmen who find this husky "stern-kicker" the ideal power plant for dinghy or tender. Saves time and work in bringing guests or supplies from club to anchorage.



2 Horse Power
Automatic Reverse
Built-in-flywheel Magneto

With this sturdy, compact motor clamped to any small boat you own or rent, you're through with the hard work of rowing or paddling—through with blistered hands and a tired back. A turn of the flywheel and away you go. A day's sport at a trifling cost!

See the Evinrude at your sporting goods or hardware dealer's. He will tell you why it costs only $10 a year. Or send for catalog.

Evinrude Motor Company
427 Evinrude Bldg., Milwaukee, Wis.

Distributors:

69 Cortlandt St., New York, N. Y.
214 State St., Boston, Mass.
440 Market St., San Francisco, Cal.
211 Morrison St., Portland, Ore.

Service Stations:

Savannah, Ga.
5101 S. Main St., Los Angeles, Cal
122 Chartres St., New Orleans, La.
10-20 No. Howard St., Baltimore, Md.
229 N. State St., Chicago, Ill.
334 Jefferson, E., Detroit, Mich.
137 McGill St., Montreal, Que.
1205 Langley St., Victoria, B. C.

EVINRUDE

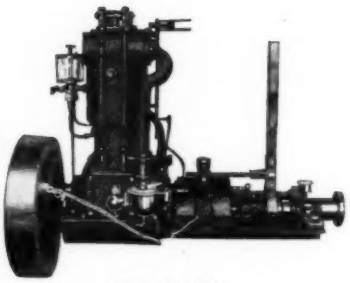
DETACHABLE MOTOR FOR WATERCRAFT

ANOTHER Frisbie powered boat of Alden design. The schooner "Gilfan," owned by Gilbert D. Maxwell, Montclair, N. J., powered with a single cylinder 16 H.P. Frisbie Valve-in-Head Motor.

The "friendly" Frisbie is proving its suitability as an auxiliary power plant in many of this season's most carefully designed and equipped sailing yachts.

If you are looking for a powerful, reliable auxiliary motor, or an economical medium-duty engine for any sort of work, write for Frisbie catalog and name of nearest dealer.

Frisbie Motor Company
7 COLLEGE ST.
MIDDLETOWN, CONN.



Ten Models
1 to 6 cylinders
5 to 75 H.P.
All Four Cycle

Immediate delivery can be made on 5, 7 and 10 H. P. Motors.

Advertising Index will be found on page 126

Astern in 48 Seconds!

"ON three different occasions, in the self-righting, self-bailing life boats of the service, I have tested the backing power of Joes Gear, and have had the boat going astern in 48 *seconds* from full speed ahead, this included the time necessary to throttle the motor down and shift the gear.

The boats are powered with a 40-45 H.P. Holmes Motor, and weigh about 15,000 lbs."

(Signed) John S. Miller,
Repairman of Motor Boats, United States Coast Guard.

Wherever prompt action is demanded, Joes Gears prove their superiority. They take hold with a high ratio of reverse speed that gives you the maximum of backing power the instant you throw the lever. Yet they work so smoothly that you can reverse from full speed ahead to practically full speed astern a thousand times a day without shock to your engine or damage to your gear.

Send for Joes Catalog

Describes Joes Gears for every need and speed; also Joes Reliable One-Way Clutches and Safety Rear Starters.

The Snow & Petrelli Mfg. Co.
156-B, Brewery St, New Haven, Conn.

JOES REVERSE GEAR

FOR EVERY NEED AND SPEED

80%-88% Reverse Speed Ratio

AGENTS

New York City—Sutter Bros., 44 Third Ave., Service Station Foot of East 92nd St., Brooklyn.
Philadelphia, Pa.—W. E. Gochenaur Mfg. Co., 631 Arch St.
Detroit, Mich.—Henry H. Smith & Co., 234 Jefferson Ave.
Chicago, Ill.—W. L. Masters & Co., 229 North State St.
New Orleans, La.—Arthur Duvic's Sons, 130 Chartres St.
Southern Calif.—Fellows & Stewart, Inc., Wilmington.
San Francisco, Calif.—A. G. Hegben, 440 Market St.
Seattle, Wash.—Pacific Marine Engine Co.
Toronto, Canada—A. E. Williams Machinery Co.
Montreal, Canada—The Pyke Motor & Yacht Co.
Newfoundland—John Barron & Co., 241 Water St., St. Johns.
England—J. King & Co., 10 Church Row, Limehouse, E. London.
Norway—Arendahl Motor & Machine Co., Arendahl.
Turkey—Societe Generale d'Automobiles, Constantinople.

Time Is Money

The quickest, cheapest and best way to prepare your boat for painting is to use

Your friend,

PHENOID

TRADE MARK

Paint *and* Varnish Remover

Quickly dissolves and softens the old hardened paint and varnish right down to the surface so you can scrape it off like fresh putty. Leaves a clean smooth surface that takes the new finish perfectly.

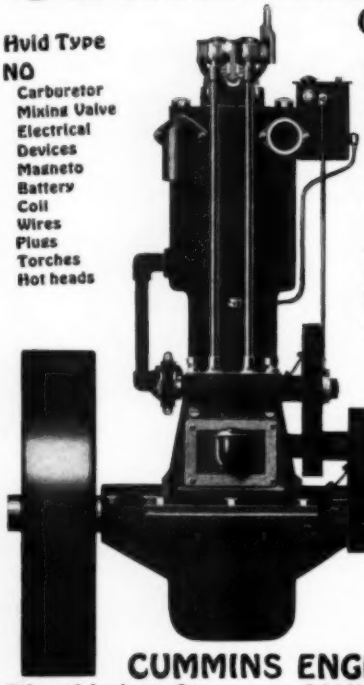
Easier and safer than burning off. Quicker than any other method. PHENOID is harmless to wood or metal or subsequent coats of paint.

Tell your dealer you want PHENOID—don't accept substitutes. If he wont supply you, we will. Write today for free booklet with valuable hints on paint removing.

CHALMERS CHEMICAL CO.

117 Chestnut Street Newark, N. J.

Cummins Oil Engines



OPERATE on any free-flowing low grade fuel, such as kerosene, distillate and most grades of crude oil. More simple and reliable than a gasoline engine and cost only 1/6th to 1/10th as much for fuel.

Can be started cold without priming in any weather. Ignition solely by compression. No fire risk.

Prompt deliveries on single cylinder, 7-8 H.P., and double cylinder 14-16 H.P. Bore 5", Stroke 7½".

Write to-day for prices

CUMMINS ENGINE CO.

7th and Jackson Sts. COLUMBUS, IND., U. S. A.

Diesel Engines for Commercial Boats

(*Continued from page* 108)

engineer sleeps. This practice is, of course, not to be recommended, but these are the actual conditions obtaining, and show the reliability and simplicity of powerplants of this type. In the case of small harbor boats, it is customary to have the engines controlled from the pilot house, and oftentimes in this case the entire crew consists of a captain and deckhand. Where 200 h.p. or more is installed, and particularly in the case of vessels depending upon their engine power alone for propulsion, several engineers are carried; but in any case the number of men carried and the cost of operation depend upon the size of the powerplant and conditions of operation rather than upon the type.

No marine powerplant can be considered which is not reliable. In fact, several other shortcomings can be tolerated but unreliability cannot. The question of fire risk has already been discussed and the advantage of the oil engine shown. As for mechanical operation there is little choice as with a properly designed and installed engine, any one of the three types under discussion is thoroughly reliable as is daily attested by the large number of boats in operation which depend entirely upon these engines for their propulsion.

Mechanical Reversing Gears

It has been shown that the Diesel engine has a field almost to itself in sizes above 100 h.p., and even today as young as the industry is the type of engine most suitable for this class of work has been very thoroughly proved. It will be found that the Diesel engine almost universally used in these sizes is of the four-cycle type. This is because of the greater simplicity as compared with the two-cycle type. In this size of four-cycle it is not necessary to cool the working pistons; hence all complications inside of the crankcase are omitted. Also a mechanical reversing gear is cheaper and has many operating advantages over a directly reversible engine. This means that the number of cylinders and mechanical arrangement on the engine are not primarily dependent upon the requirements for reversibility, but can be chosen to best suit other conditions. Therefore it is found that the usual type is a four or six-cylinder four-cycle engine made reversible by the use of a mechanical gear. The four-cycle engine is also slightly more economical as regards fuel consumption than the two-cycle, and there are certain other mechanical advantages, such as reversing of pressure on the bearings and easier heat conditions in the working cylinders which make the four-cycle look so attractive.

The question of where to begin to build directly reversible engines and leave off the mechanical reversing gears is one that depends upon many factors. With a directly reversible engine a minimum of six cylinders is required to provide for reversibility under all positions of the crank; whereas if a mechanical reversing gear is fitted, a four-cylinder engine can be used which will provide larger cylinders and a lower number of revolutions per minute for a given horsepower. This is an advantage in marine work as it provides a more efficient propulsion with a reduced number of revolutions, and this is advantageous from the mechanical standpoint where hard continuous service is expected over long periods. The weight and cost is, of course, slightly increased as compared with a six-cylinder engine; but the other advantages outweigh this disadvantage. If considerable maneuvering is to be done, the mechanical reversing gear has a decided advantage, because no matter how many maneuvers are executed or how fast the signals come from the pilot house, every signal can be answered without using compressed air, and compressed air in large quantities for maneuvering engines is very expensive. Of course, even on the non-reversible engine with the mechanical reversing gear the engines are started by compressed air, but the amount of air-flask capacity required is very much reduced, and very simple provisions can be made for renewing this supply; whereas in the case of a directly reversible engine the question of refilling the starting flasks is an important one, and in some cases would require the supplying of a separate auxiliary compressor unit for this purpose alone. When it is considered that in the case of tug boats and some fishing vessels that 5 or 6 hr. continuous maneuvering with a signal from the pilot house every few minutes or oftener is the condition to be met, the advantages of a non-reversible engine with a mechanical reversing clutch are evident. The question of obtaining a reliable mechanical reversing clutch is very important. There are many gears on the market for the smaller sizes say up to 100 h.p., but in powers larger than this there are very few firms in a position to supply a clutch powerful enough to withstand the severe usage given it under the circumstances just mentioned, and in many cases the engine builder is driven to designing and building his own clutch especially for his engine. The point is soon reached in size, however, where the mechanical reversing clutch becomes extremely large, heavy and costly, and then in spite of its advantages from the operating standpoint, it is necessary to get back to a directly reversible engine. There is, of course, no

(*Continued on page* 118)

Advertising Index will be found on page 126

In Price, Appearance and Performance Here Is the Season's Big Sensation

THIS is the standardized 26 foot Express Runabout, designed and built by Chris Smith, the "speed wizard of Algonac." Every detail is the result of his many years of successful boat building with the result that this wonder boat embodies the best points of the best boats yet sells for about one-half of what you would expect to pay for such a boat. Standardization alone has made possible the comparatively very low price.

We invite you to compare the design, workmanship and performance with any other boat to be had at any price knowing that at every point this Smith boat will prove to be an easy winner.

For example, in design there can be no question as to Chris Smith's genius—one has but to recall the wonderful success of his national and international champions, Miss America, Miss Minneapolis, Miss Toronto, Miss Detroit, Gar, Jr., Gar, Jr. II and many others.

In workmanship, it has been an outstanding feature of all Smith boats that they have always stood up under the hardest tests yet are most beautifully finished.

In performance, there is no other 26 foot runabout with a 4 cylinder engine that can equal the speed of this boat, take the short turns so cleanly, be so absolutely dry and seaworthy and ride so comfortably.

Its length is 26 ft., the beam 6 ft. 6 in., draft 22 in. V bottom, double planked, fully equipped for fresh and salt water. Seating 8 people comfortably. Guaranteed speed 30 miles (the tests showed 35 miles).

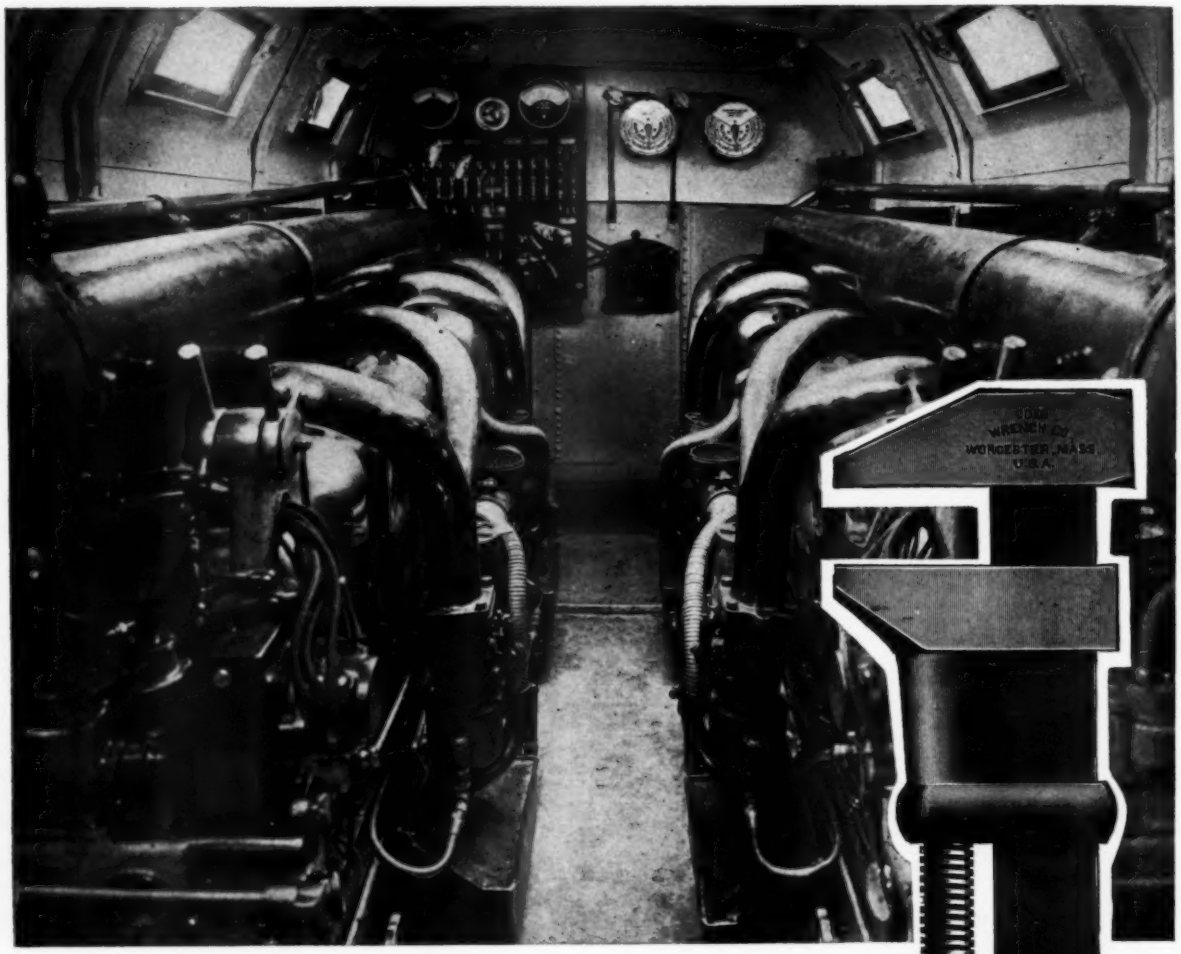
The power plant is the Hall-Scott 5¼ x 7 four cylinder 100 horsepower engine, complete with electric starting and lighting, standard reverse gear, water cooled exhaust manifold, 160 ampere hour battery. In fact a complete and perfectly operating power plant in every way.

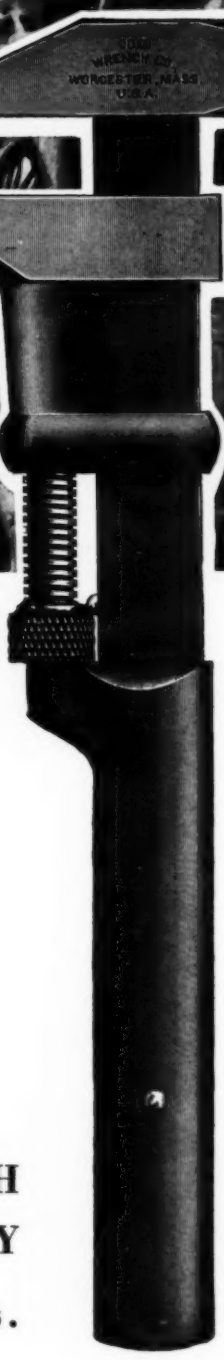
The price on the standard finish boat (painted hull with mahogany trim) is only $3,950 f.o.b. Algonac, Mich., plus war tax. The special finish of full mahogany is $500 extra. Orders should be placed promptly to avoid disappointment from late delivery.

Address all inquiries for Smith built boats to

CENTRAL MARINE SERVICE CORP.

723 Vinton Building **Detroit, Mich.**





Power, Strength, Coes Wrenches Quality, Ability and Satisfaction

You choose your power-plant after great deliberation and much thought.

It Must be the Best.

Then a set of COES WRENCHES and you have all that money can buy.

Eight sizes, all steel, from 4″ to 21″ and made for real work. Ask your dealer.

TRADE MARK REG. U.S. PAT. OFF. NO. 64696

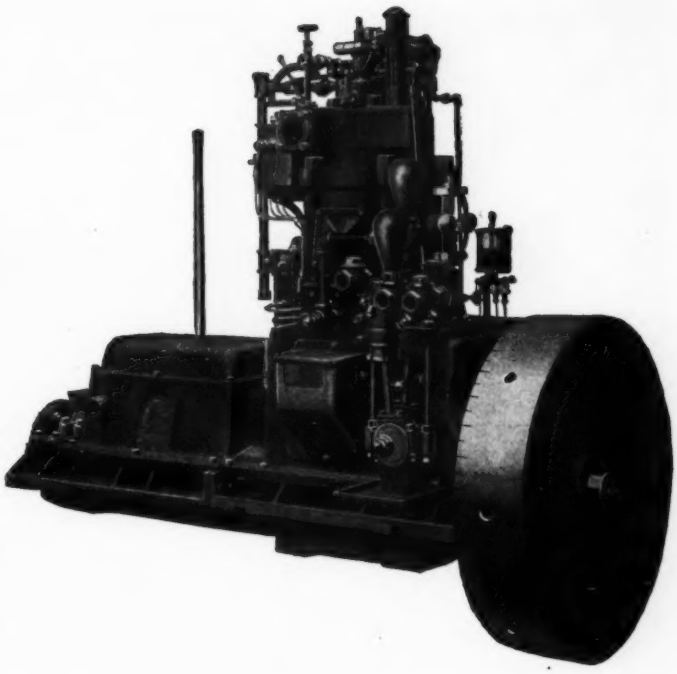
Coes

COES WRENCH COMPANY

Worcester, Mass.

Advertising Index will be found on page 126

The power of six with the simplicity of one



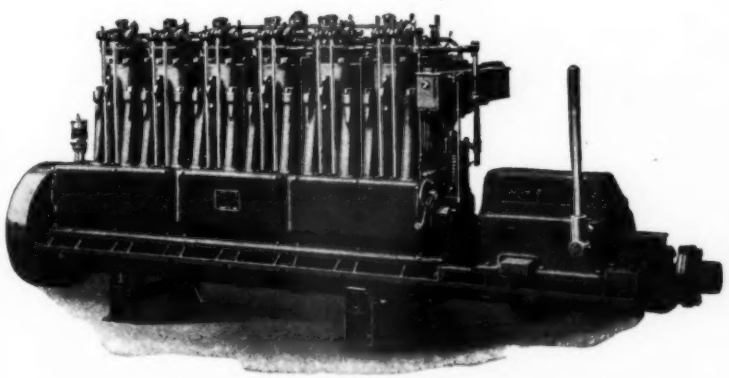
Between the one cylinder Dodge Heavy Oil Engine, Marine type at the right and the six cylinder one below there is a wide gap—*in power only.*

The mechanical simplicity of the one is duplicated in the other.

Dodge Heavy Oil Engines, Marine type, are built up of cylinder units. A six cylinder Dodge Engine is simply six one-cylinder units mounted on one crank case.

Each cylinder of a Dodge engine develops 12½ horsepower. With five sizes to choose from—one, two, three, four and six cylinders—there are no wide variations to force over-powering.

Further, each size does not vary so radically in construction as to require extra study and grief when one graduates from smaller to larger boats.



Anyone that can handle—and anyone can handle—a single cylinder Dodge Heavy Oil Engine, Marine Type, is master of the six cylinder even before he buys it.

Dodge Sales and Engineering Co.

Mishawaka, Indiana, U. S. A.

Designed and Made by J. E. Caldwell & Co.

WOOD-FISHER GOLD CHALLENGE CUP

Width, including handles, 17 3-8 inches.
Height, exclusive of ebony base, 8 inches.

A two-handled bowl, of classical form, made of 14 karat gold. The laurel sprays growing out from the handles around the top of the bowl, the hydria laurel leaf decoration, and the fluting are finely chased.

An applied molding encircling the body of the cup forms the lower edge of a panel, in which, chased in high relief, is a scene depicting a race between boats of the type which will compete for this trophy. Above the racing scene, enameled in proper colors, are the crossed flags of the clubs of which the donors are members.

The reverse of the cup bears the title, "Wood-Fisher Challenge Cup"; and above is applied the emblem of the American Power Boat Association enameled in proper colors.

Applied to the black ebony base are eight gold shields for yearly records of winners.

J. E. CALDWELL & COMPANY

JEWELERS — SILVERSMITHS — STATIONERS
DESIGNERS AND MAKERS OF FINE TROPHIES

PHILADELPHIA

Diesel Engines for Commercial Boats

(*Continued from page* 114)

definite line of demarcation, but it is considered that somewhere in the vicinity of 300 h.p. it is generally cheaper to build a directly reversible engine than it is to build a mechanical reversing clutch which will be stout enough to stand up with the engine.

The Electric Drive and the Steam Engine

There is another solution to the problem of reversing the propeller in a motor boat and that is the electric drive. In this case a non-reversible engine or engines drive generators and run at a constant speed. On the propeller there is a motor which receives its power from the generators and its speed and direction of rotation are controlled by electrical means. This type of installation has several advantages, particularly for some special cases like fishing trawlers, tug boats and fire boats. In the first place it is usual to provide at least two engines even for a single-screw boat. This gives added reliability, reduces the first cost because smaller engines are used than in the case where one engine alone is used, there is extreme flexibility and the controlling of the boat from the pilot house is a very simple matter. A very important feature, however, is that in case the boat is slowed down the motor only takes the overload and the engines and generators run at regular power and speed. This particular phase is important for tug boats and fishing trawlers where for a very large portion of the time the speed of the boat is slowed down due to resistance of the tow or of the trawl, but full power is desired from the propelling machinery. In the case of direct-connected engines under these circumstances the revolutions of the propeller are, of course, decreased, which in turn decreases the power output available from the engines. The advantage in the case of a fire boat is in the great flexibility of control and operation; that is the engine would drive the generators at constant speed and power could be taken as required for the motors, for propulsion and the motor-driven fire pumps.

As has already been mentioned, the Diesel engine in the larger sizes of several hundred horsepower for commercial work boats has for its principal competitor the steam engine. One particular phase of this competition is in the case of the fishing trawler. These vessels have long runs from their home ports to the fishing banks and hence require considerable amounts of fuel to take them to the fishing banks and back, to say nothing of that consumed while trawling on the banks. These boats are of course only of moderate sizes and the question of radius of action is very important. In the case of steam trawlers it actually requires an increase in the size of the boat in order to be able to carry coal enough for the round trip, and even then some of the banks in the North Atlantic which are fished from New England ports are so far away that the steam trawlers cannot carry fuel enough to make the trip. In the case of the Diesel engine matters are entirely different. The company which I represent has made two installations in boats of this character. Both of them are about 150 ft. long and carry approximately 300,000 pounds of fish. One boat has a 360-h.p. directly reversible engine and the other has two 240-h.p. engines with the electric drive. A speed of approximately 10 knots is obtained and these boats have a cruising radius at full speed of about 6000 nautical miles and at three-quarters speed of about 9000 nautical miles. This is more than sufficient to take them to the farther-most fishing banks and back. In other words, in this particular field the Diesel engine has no competitor and while these faraway banks are not fished very much at present on account of the plentiful supply of fish nearer home, yet it may mean in the future that all trawlers with the exception of those propelled by Diesel engines will be driven out of the business.

In conclusion then it can be said that for yachts or for any boat which operates very little, the first cost is of more importance than the cost of fuel and hence the gas engine has a decided economical advantage. This advantage is more and more pronounced as the size of the powerplant is decreased. But in the vast majority of cases, some form of oil engine is the only type which a commercial motor boat owner can consider which will meet all of his requirements. For sizes of 100 b.h.p. and less, some form of hot-bulb or surface-ignition engine has the field to itself, but for sizes above 100 h.p. the Diesel engine shows its superiority more and more until for 200 or 300 h.p. and more, it, in turn, has the field almost entirely to itself. The ordinary tug boat, passenger boat and fishing boat uses the Diesel engine because of its economy, and the first boat will use the Diesel engine because of its absence of standby losses. Reliability, simplicity and ease of attendance are essential in all cases, and the present day Diesel engine is fully up to the requirements.

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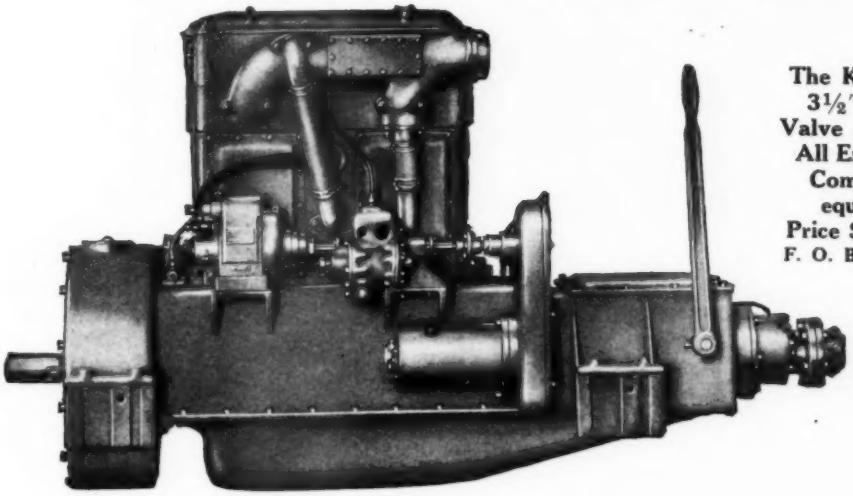
Knox
VALVE IN HEAD

"Steady Service"

A True Quality Engine

of Popular Size and Price



The Knox 20
3½" x 5"
Valve in Head
All Enclosed
Completely equipped
Price $840.00
F. O. B. Factory

Marine engine design has progressed notably in the past two years. The leading high-grade engines of today are a marked advance over earlier models. When you buy an engine, don't be satisfied with an old design—choose one that is up-to-date in every particular.

The Knox 20 is up to the minute and complete in every feature and refinement. True quality and service are built into every part. The equipment such as starting motor, generator, pump, magneto, etc., is built in—not added externally.

An internal pressure lubricating system automatically takes care of every bearing and moving surface—even the reverse gear and valve mechanism included. Nothing has been overlooked in the Knox 20 design. And its materials and workmanship are the best.

If you don't know the Knox 20, you don't know how good a 20 h.p. motor can be. Let us send you the full description. Write for it today.

KNOX MOTORS ASSOCIATES
SPRINGFIELD, MASSACHUSETTS, U. S. A.

Made in New England at Springfield, Massachusetts, by Knox Motors Company, also manufacturers of Truck, Tractor, Passenger Car Engines and industrial power sets.

Motor Boating

Hacker-Craft

ADIEU is a special 32-foot seven passenger Runabout, which can be duplicated at a moderate cost. Adieu was delivered without trial, and with no tuning up, and just a bare trial at Miami, went out and won the race. Just what might be expected of a HACKER BUILT CRAFT. WE can duplicate ADIEU, carrying a speed of not less than 42 miles. Or build you a special with greater speed. If interested write.

A Hacker Boat won the Miami Race five times in the last six years. An enviable record.

WE WILL BUILD TO YOUR ORDER—AT PRE-WAR PRICES

26-Foot Special, Double Cockpit. Similar to Bear-Cat (the original of which was designed and built by us), but improved. Powered with a four cyl. Hall Scott Motor. Speed not less than 31 miles. Complete in every respect. Special price, including tax.....$6875

29-Foot Special, Double Cockpit. Carrying five passengers in forward and five in aft cockpit. Powered with four cyl. Hall Scott Motor. Speed not less than 30 miles. Complete in every respect. Special price, including tax.....$7675

29-Foot Special, Double Cockpit. Carrying two passengers forward and five in aft cockpit. Having controls in either cockpit. Powered with a G-R four cylinder Sterling Motor. Speed no less than 33 miles. Complete in every respect. Special price, including tax.....$7900

35-Foot Special, "Snap-Shot" Type. Carrying five passengers forward and five to seven aft. Powered with G-R six Sterling. Speed not less than 36 miles. Complete in every respect. Special price, including tax.....$9750

35-Foot Liberty Type. Same as above, but Liberty powered. Speed, from 45 to 50 miles. This is a De-Lux outfit, and has done actually 36 miles in 45 minutes, with seven passengers.....Price upon application

We will figure on any high class proposition in a high speed outfit. Quality, performance, and speed guaranteed.

HACKER BOAT CO.

Shops: Detroit and Mt. Clemens **Office: 1525 Crane, Detroit**

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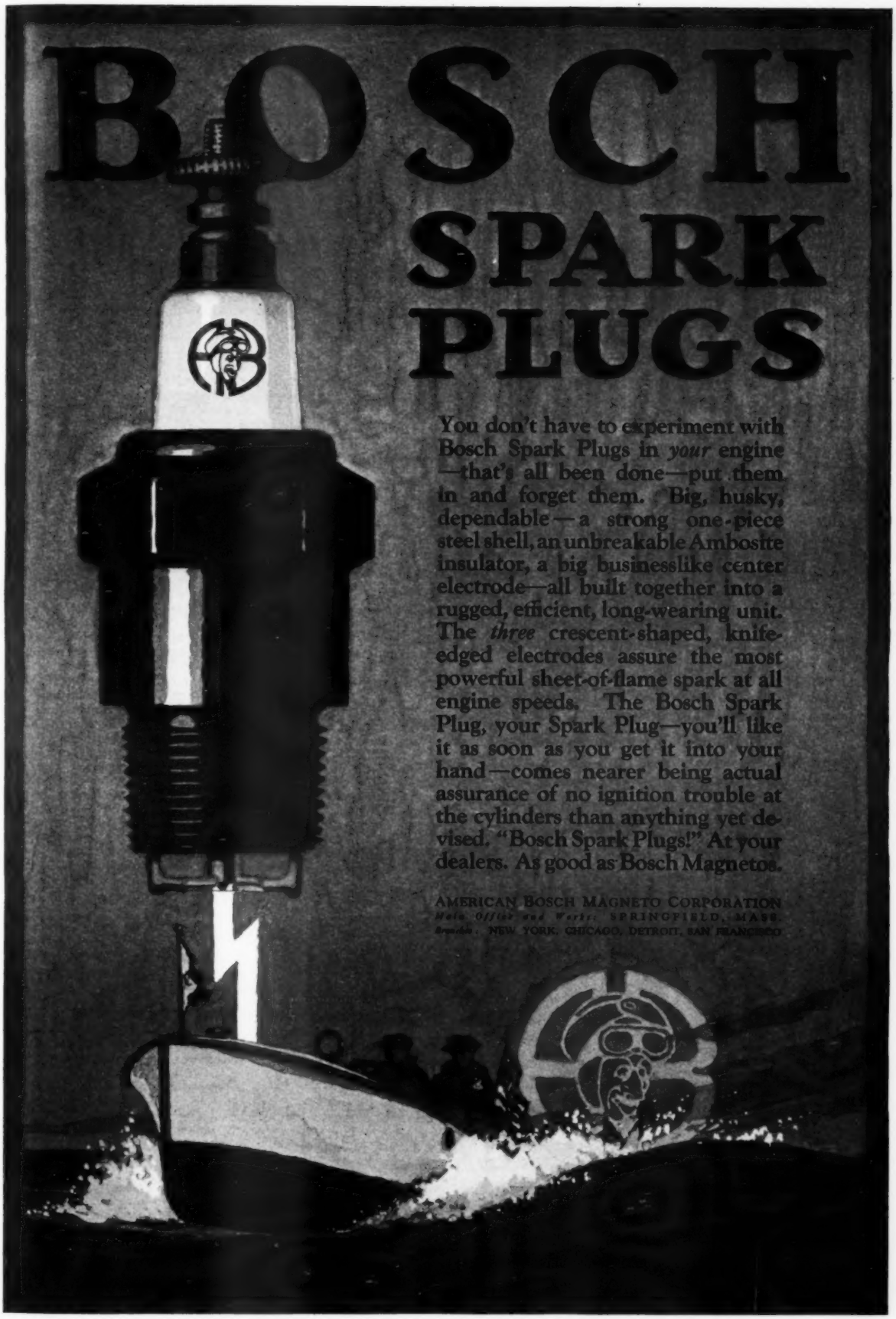
BOSCH
SPARK
PLUGS
You don't have to experiment with Bosch Spark Plugs in *your* engine—that's all been done—put them in and forget them. Big, husky, dependable—a strong one-piece steel shell, an unbreakable Ambosite insulator, a big businesslike center electrode—all built together into a rugged, efficient, long-wearing unit. The *three* crescent-shaped, knife-edged electrodes assure the most powerful sheet-of-flame spark at all engine speeds. The Bosch Spark Plug, your Spark Plug—you'll like it as soon as you get it into your hand—comes nearer being actual assurance of no ignition trouble at the cylinders than anything yet devised. "Bosch Spark Plugs!" At your dealers. As good as Bosch Magnetos.
AMERICAN BOSCH MAGNETO CORPORATION
Main Office and Works: SspringfieldMass.
Branches: NEW YORK, CHICAGO, DETROIT, SAN FRANCISCO

Get Busy — Motor Boat Owners

Launching time is near—now is the time to paint up—scrape up—renew fittings—smarten up your boat for the coming season. We can save you lots of time if you will write in for a copy of the new catalogue of

Tiebout Marine Hardware

In this catalogue is listed everything that a boat owner needs, from a nail to an anchor, all illustrated, with the price of each article named. When you are in need of supplies, you can look up these articles in the catalogue at your leisure, note down the stock numbers and the price, so that when you come down to our salesrooms you save much valuable time that otherwise would be lost while you were waiting for the different styles to be shown to you. Ordering from the catalogue also prevents errors and facilitates delivery of any orders you might mail in.

TIEBOUT HARDWARE is dependable and can be relied upon to deliver the service you require.

Ask for a copy of our catalogue—then use it.

W. & J. TIEBOUT

118 Chambers Street, New York City

Established 1853 Incorporated 1892

Hippo Makes Ready for Voyage

(*Continued from page* 60)

played its part in the chaser race from Bermuda to New York in August of 1919 and is accustomed to the kind of warfare that any precision instrument encounters in small boat usage.

In addition we have a four-inch boat compass of the spirit type, barometer, log, stop watch, and the necessary charts and navigational publications, and two of us are equipped with experience in piloting and in deep sea navigation. If memory, chronometer, octant, and Bowditch all go by the board, the order of the day will be to head west in the Atlantic and East in the Pacific until a large continent is sighted. If the compass mutinies we shall try to distinguish sunrise from sunset and to some extent be guided by our bumps of location.

For this cruise to Frisco isn't going to be one of your deadly serious, methodical, undeviating voyages. It will be a get-there cruise, but we shall not be committed to any itinerary except that we shall run down the Atlantic Coast to the West Indies, jump from Jamaica to Colon, pass through the Panama Canal and make the best of our way up an uninviting coast to San Francisco. We shall welcome advice as to course and intermediate stops from experts en route, and if we are particularly advised to go to or keep away from any island or stretch of coast we shall stand off or head in as the inclination moves us.

We are not undertaking the cruise to prove anything or to establish any precedent in small-boat sailing. Having no old worries to sail away from we absolutely refuse to entertain any new ones regarding the strength of wind and treachery of currents ahead. We plan merely to take a voyage which in the aggregate is longer than the average but which is composed of a number of three- or four-day jumps, such as any well found boat might take if its owner had the time at his disposal. If the experience stimulates the sport of yachting, or if the passage of an auxiliary through tropical waters spreads the gospel of American motor boating, others besides ourselves will derive benefit from the cruise. We, however, shall take the cream of the enjoyment.

Some of the friends whom I have acquired since I started work on the boat have been a little skeptical about the success of the expedition. They think, not without reason, that I'm a landlubber who is biting off more than he can digest in a seaway. But in my own defense I must say that I look a little less sophisticated than I am, even though my careless habit of speech sometimes betrays me. Yesterday, for instance, when I was rubbing down the hoops on the mainmast preparatory to varnishing them, I remarked casually that it would be awkward at sea to have to unstep the mast in order to replace a broken hoop by threading the mast through a new one. My shipmate replied encouragingly that we could use the power while this threading process was taking place, and we let the conversation lapse.

But an old salt who was standing by overheard us and with a pitying look in his eye volunteered the information that new hoops could be riveted in place without unstepping the mast. I accepted the information meekly, but I know that that old salt thinks I belong to the class of sailors who in passing under a fixed bridge will cut a hole in the bridge to give them headroom. Perhaps I do—but as soon as the moon gets full (if it ever does in these dry days) Hippocampus will take the water and her crew will head away from fixed bridges and advice and into the roll of the deep blue sea. After that we shall see what we shall see.

Buoys, and How to Use Them

(*Continued from page* 96)

in coast lighting. The first buoy of this kind was a gas buoy established experimentally by its manufacturers in 1881 near Scotland Lightship, entrance to New York Bay; it was officially taken over by the Lighthouse Service in April, 1884.

Gas buoys are made in a number of different sizes, weighing from 2,800 to 34,500 pounds each, depending on the importance of the location, and burn continuously by night and day for intervals of a month to a year without recharging. The apparatus is patented by the various makers and has been brought by them to a considerable degree of perfection, so that considering the rough usage to which such buoys are subjected by the elements, gas buoys are generally satisfactory within the limits of reliability to be expected from such aids. Gas buoys furnish valuable marks for approaching entrances, defining channels, and marking dangers, and at times may obviate the necessity for light vessels or lighthouses on submerged sites, either of which would be many times more expensive. There is a constant demand among mariners for more gas buoys and for buoys with more brilliant lights.

Many gas buoys are provided with some automatic form of sound-producing device, such as a bell or whistle, and in a few cases have both a whistle and a submarine bell. These are of especial value in fog or thick weather, or in case of accidental extinguishment of the light.

Advertising Index will be found on page 126

Choose Your Favorite Type of

RAJAH SPARK PLUGS

IF you are a wise and experienced motor boatman you will probably throw away your assortment of old troublesome spark plugs and buy a complete new set of good plugs to start the season right. Your boating hours are all too short to waste a single minute for trouble you can avoid at so little expense.

Make sure your new plugs are Rajah—get the best while you are at it. They cost no more than ordinary plugs and they *are better,* as thousands of boatmen can testify.

Rajah Plugs have been marine favorites for twenty years. Many boatmen will use no other. Countless races stand to their credit. Several manufacturers of high grade marine engines have used Rajah Plugs for years as standard factory equipment. The leading marine engine and supply dealers sell them because they always satisfy and make *ignition absolutely sure.*

½" Standard

If your dealer does not have genuine Rajah Plugs, send us his name, tell us the size you want, and we will see that you are supplied, postpaid. If you are not sure of the size, tell us the name of your engine.

Standard Rajah Plug	**$1.00**
Giant Rajah Plug	**1.25**
Waterproof Rajah Plug	**1.50**
Rajah Safety Nipple	**.15**
Extra Rajah Terminals	**.10**

½" Giant

Standard ½" Long

Metric Standard

⅞-18 Standard

Waterproof, Shockproof, Breakproof. All threads

Priming ½" $1.50

⅞-18 Giant

Rajah Terminals save time and trouble. Fit any plug

Thumb Nut — with all Rajah plugs unless Ball or Stud type preferred

Regular Fits any size cable

Thrust

Hook
Furnished with ferrules to fit any size cable

Primary Ferrules to fit cables up to ½"

Rajah Safety Nipple. Keeps connections dry. Protects against shocks

Manufactured by Rajah Auto-Supply Co., Bloomfield, N. J., U. S. A.

Inverted V-bottom and surface propeller boats

SEA SLED

Hickman Patents in all countries

Trade Mark Reg. U. S. Pat. Off.

George Leary, Jr.'s Sea Sled *Orlo II*, 47 miles per hour. Holding world's record for marine engined displacement boats by 5.2 miles.

What Did Happen in Florida:

1. The 5½-ton *Orlo II*, with side-plate rudders not designed for racing, running on a little 2-mile inside racing course, made the 50 turns fast enough to beat the best laps and the best 50 miles of the screw propeller boats of less than half her weight.

2. In the mile trials *Orlo II made 47 miles per hour, against 41.8* for the finest development of screw propeller displacement boats *and on a weight of over 24 pounds per horsepower against their 19 pounds.* Based on this result and built to the same weight per horsepower as the competing boats, the Sea Sled would show 9 to 11 miles greater speed for the same power. For any purpose where speed or efficiency is concerned *the screw propeller displacement boat died at Miami.*

3. After the Fisher Trophy races, *Orlo II* ran up to Palm Beach (70 miles), outside, in two hours, and there carried loads of from 12 to 17 passengers at high speeds daily, for three weeks, in the Gulf Stream in all weathers, several times in 7- to 8-foot breaking seas, when the other Fisher Trophy contestants could not have lived for a moment. She ran between 2,000 and 2,500 miles without any kind of engine or boat trouble.

THE SEA SLED COMPANY

WEST MYSTIC CONNECTICUT

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HERE'S A BEAUTY!

27 ft. Runabout, Design E-28

Developed and proved in 1920; (we sold all we could build of them up to August 1st)

SPECIFICATIONS:

Length over all	27 ft.
Beam	5 ft. 3 in.
Draft	22 in.

Cockpit floor, from front of aft seat to back of forward seat 5 ft. 6 in.

Forward seat divided, corridor effect.

Normal capacity six to eight persons.

All frame work best white oak with copper and bronze fastenings.

Planking copper-riveted over copper burrs.

Decks laid in narrow strips of mahogany, blind nailed, seams filled with seam composition.

Hatches, coaming and entire interior finish in mahogany, bulkheads and lockers handsomely panelled and fastenings plugged.

Brass cutwater.

Engine hatches brass-mounted.

Brass-mounted rubstrake and bilge guards.

Polished brass deck hardware.

Copper cowl ventilator.

Power, Fay & Bowen Model LN-42 four-cylinder four-cycle engine complete with high tension magneto and reverse gear.

Electric starting and lighting system complete with battery and instruments.

Electric sailing lights with proper screen boxes, all conforming to law, both lights and screen boxes readily removable so that they are not in evidence during daylight. The stern light is a Holophane globe mounted on special pole of regulation length. There is also a dash light and an extension inspection light.

Bulkhead assembly includes ignition and lighting switches, ammeter and dash light.

Electric signal horn.

Dash control for regulating mixture.

Pyrene fire extinguisher with bracket.

Cushions for all seats (buoyant), Kapoc filled and lazybacks upholstered to match.

Best linoleum on floor.

Latest improved Wilcox & Crittenden auto steering wheel with spark and throttle levers on quadrant.

Bronze steering cable.

Bronze propellor outfit throughout including bronze shaft.

Bronze rudder and strut.

Wind Shield, folding type.

United States yacht ensign and also name pennant, each with mahogany staff;—mahogany name boards;—brass tipped boat hook;—mooring lines, bilge pump, tank funnel, tool kit.

SPEED NINETEEN MILES AN HOUR.

FAY & BOWEN ENGINE COMPANY

104 Lake Street GENEVA, N. Y. U. S. A.

NEW YORK: 44 Third Ave., at 10th St., Sutter Bros., Representatives.
PHILADELPHIA: 116 Walnut St., Marine Equipment & Supply Co., Representatives.
BOSTON: 84 Atlantic Ave., Gray-Aldrich Co., Representatives.

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WYMAN-GORDON
GUARANTEED FORGINGS
STANDARD OF THE INDUSTRY

GUARANTEED FORGINGS

The Backbone of the Finest Automotive Engines

WYMAN — GORDON
The CRANKSHAFT MAKERS
WORCESTER, MASS. CLEVELAND, OHIO.
CHICAGO, ILL.

TO COMMAND
Distinction—Respect—Attention
Equip Your Boat With A

"STROMBOS"
MOST POWERFUL OF ALL SIGNALS

Length 16¼ inches

1. Uses 1/10 the amount of air required by a whistle.
2. Penetrates and dominates the loudest noises.
3. Power of many ordinary horns concentrated in one.
4. Its agreeable tone does not shock the ear.
5. Cannot be confused with other sounds.
6. Never out of order. Always ready.
7. Needs no attention. No adjustments.

A tone of tremendous power and penetration, unlike any other, pleasing in quality—crashing, intense in volume. Audible at great distances. Commands and compels attention for "STROMBOS"-equipped boats wherever they go. Your "STROMBOS" will be the envy of your club, the sensation of the fleet.

The Ideal Long-Distance Signal for motor boats and yachts. Now installed on "Lady Grace", "Nadesah", "Dirinda", "Golden Days", "Palestine", "Nahmeoka" and many others.

Write today for Circular M-B. We guarantee the "STROMBOS" or money refunded.

Boat Builders! We co-operate with you. Write for particulars.

AMERICAN STROMBOS COMPANY, Inc., Market and 18th Sts. Philadelphia, U. S. A.

Oberdorfer

Bronze Geared PUMPS

PERHAPS you don't realize that the safety and life of your engine depends upon the reliability of your oil and water pumps. A single failure of these pumps might seriously damage your motor in a few minutes, before you even noticed there was any trouble.

Experienced boatmen are learning to appreciate this fact. That is why more and more leading motor builders are supplying the reliable Oberdorfer pumps for standard equipment—more and more dealers are carrying Oberdorfer pumps in stock—more and more boat owners are buying Oberdorfers to replace other pumps which have failed.

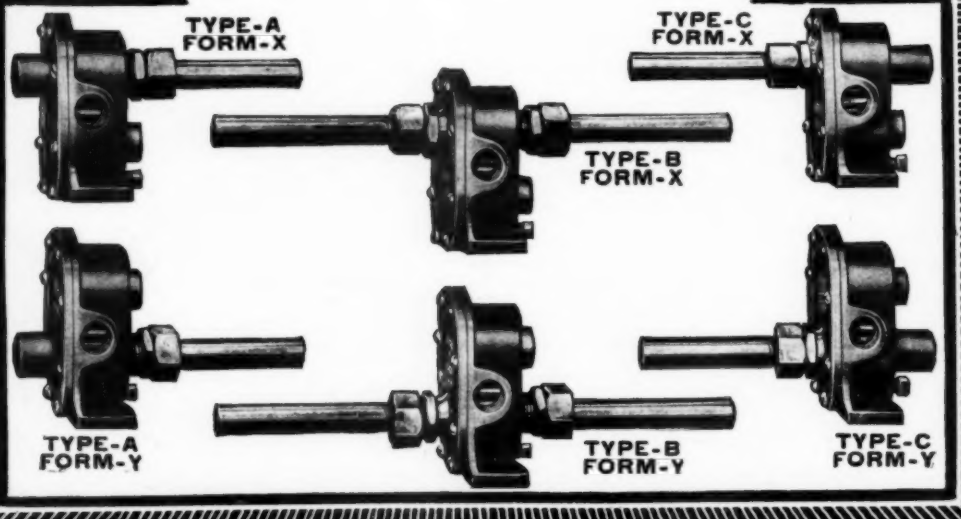
Oberdorfer Bronze Geared Pumps are positive and automatic in operation. They will raise water three feet without priming and the volume of liquid pumped varies directly with the engine speed. These pumps are rustproof, wearproof and trouble proof. Once properly installed, they should outlast your motor.

We have models suitable for pumping oil, water or fuel on every size and type of marine engine and every form of installation. In fact these pumps are being used for handling many other kinds of liquid in factories and stores, and on different kinds of machinery.

Write today for the Oberdorfer Pump book.
It's worth reading—free on request

M. L. OBERDORFER BRASS CO.

812 EAST WATER STREET SYRACUSE, N. Y.



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(ALIAS)